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RE : RESPONSE TO APPEAL AGAINST THE DECISION TO REFUSE THE APPLICATION FOR ENVIRONMENTAL AUTHORISATION 14/12/16/3/3/2/2006 APPLIED FOR BY KARPOWERSHIP SA (PTY) LIMITED FOR THE GAS TO POWER VIA POWERSHIP PROJECT AT THE PORT OF SALDANHA WITHIN THE SALDANHA BAY LOCAL MUNICIPALITY, WESTERN CAPE PROVINCE

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Introduction

These submissions are made by Green Connection in response to the appeal by Karpowership SA (PTY) LTD for the Gas to Power Via Powerships Project (referred to hereafter as the Karpowership project) for the port of Saldanha Bay.

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

Reasons for Refusal of the Authorisation

The reasons for the refusal of the authorisation given by the DEFF, are the following:

1. 29.1 Public participation was deficient and there was a failure to comply with Section 21(1A)(c) of the NEMA.
2. 29.2 Significant changes were made to and/or significant new information was included in the final EIAR and was not included in the EIAR that was provided for comment during public participation process.
3. 29.3 There was a failure to conduct the public participation process in terms of Regulations 39 to 44, inclusive, of the EIAR Regulations 2014, as amended,¹ and the principles of NEMA as outlined in Chapter 2 of the NEMA.
4. 29.4 There was a failure by the EAP to ensure that all relevant listed and specified activities were applied for, were specific and could be linked to the development activity or infrastructure.
5. 29.5 There was a failure to consult with Saldehco (Pty) Limited (“**Saldehco**”), the holder of a lease over certain portions of land included in the Draft EIAR and Final EIAR.
6. 29.6 There was a failure to undertake a noise modelling study to gain a more quantitative understanding of the noise produced by the Powership and the cumulative impacts on the surrounding marine environment.
7. 29.7 The SACNASP peer review of the estuary and impact report was excluded from the Final EIAR submissions.
8. 29.8 Specialists indicated in their reports that they either had limited time to properly apply their minds, or that the studies were undertaken in the wrong season.

¹ ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS, 2014 Government Notice R982 in Government Gazette 38282 dated 4 December 2014, as amended published in GN 326 07 APRIL 2017, promulgated under the National Environmental Management Act of 1998

9. 29.9 Consequent gaps and limitations were identified which raised concerns regarding the validity of findings. These findings will be individually dealt with.

GroundsofAppeal

Ground 1

BROAD OVERVIEW AND GROUND 1: The DFFE failed to consider the strategic nature of the Project from a needs and desirability perspective given the impacts of the Project on energy risk mitigation and the development and growth of the SA Economy

1. The appeal states:

“It is evident that the DFFE have not properly considered that the Project was launched in response to the DMRE’s RFP, for new generation capacity under the RMIPPPP. It is further a SIP and is vital for alleviating the country’s current energy crisis.”²

2. This ground of appeal is repeated in Grounds 7 and 8, and the response should therefore be read as applicable all three grounds.

Ground 7: The DFFE failed to consider the section 2 principles of NEMA

Ground 8: The DFFE failed to properly assess the impact of the Project being declared a SIP.

3. All three grounds of appeal should be rejected for the following reasons:

4. In the context of the Karpowerships, the Green Connection is deeply concerned about implications of Eskom being required to sign a long-term (20 year) PPA and of NERSA granting a similar long-term generation license, for the following reasons (among others):

- While the RMI4P is intended in part to replace expensive diesel Peaker Plants, it does not make sense to replace diesel Peaker Plants that run intermittently when required with powerships that will operate 16 ½ hours a day for a period of 20 years. Reliance on these diesel Peaker Plants are likely to be reduced as Eskom’s existing plant maintenance programme bears fruit over a period of 2-3 years, while to option to convert the Diesel OCGTs to run on gas is also an option that the Green Connections understands is being considered. It also does not make sense to fill a short term capacity gap with powerships

² Appeal paragraph

contracted for twenty years when alternatives that are more cost effective and provide better value for money are available.

- Such options include alternative short term procurement that can address chronic shortages by taking a 'systems approach', which energy expert Clyde Mallison suggests could fill the energy gap with sufficient dispatchable power at an estimated tariff for a mix of PV, wind and storage of R0.61 /kWh.³
 - Other options include demand-side management, amending contracts of existing IPPs to provide additional capacity.
 - The President's 10 June 2021 decision to increase the NERSA licensing threshold for embedded generation projects to 100 MW is also estimated to unlock about 3400MW of capacity that could be deployed by the end of 2022, and a total of about 5000 MW within 5 years.
5. Apart from this the outcome of the Risk Mitigation Independent Power Producer Procurement Programme (RMIPPP), in announcing eight preferred bidders has demonstrated that the short term energy procurement with an appropriate energy mix can be fulfilled by technologies other than Karpowerships, that do not have significant greenhouse gas emissions, have more local content, and do not harm the fragile marine environment. It is therefore disputed that the project has a strategic nature **from a needs and desirability perspective**. Most of the additional impacts associated with Karpowerships are described in detail under the "no go option."
6. The Karpowership project also has significant uncertainties. The appellant is suggesting that the impacts on marine life due to noise could feasibly be assessed after authorisation, a suggestion that flies in the face of the precautionary principle and is contrary to the regulatory scheme for impact assessment, minimisation and mitigation which must take place before environmental authorisation. This is discussed further in paragraphs 123 - 126 below.
7. The Draft and Final EIA reports did not pertinently state the project is so novel that its underwater impacts on marine life cannot be determined or at least estimated to the extent required in an EIA, prior to submission of the final EIA to the competent authority. There was merely a reference to lack of data on sound power levels.⁴

³ <https://www.egsa.org.za/wp-content/uploads/2021/06/V2-Briefing-note-a-systems-approach-2.pdf> ⁴ Final EIA report page 220

8. The justification of novelty of the technology has been added after the refusal of authorisation and could not be controverted with evidence from interested and affected parties during the public participation process. This must be rejected as a basis for a successful appeal.

9. The appeal states:

“The RFP pertains to new generation capacity under the Risk Mitigation Independent Power Producer Procurement Program (“RMIPPPP”). It is a Strategic Integrated Project (“SIP”) and is considered vital for alleviating the country’s current energy crisis.”
“It is further a SIP and is vital for alleviating the country’s current energy crisis.”⁵

10. The fact that KPS has been declared a SIP does not fetter the discretion of the DEFF or any other competent state body to refuse authorisation or licensing to it on environmental sustainability grounds. It is not the only feasible solution to SA’s energy crisis.

11. The appellant suggests that DFFE should rather have permitted the activity, granted a decision in the Appellant’s favour and incorporated any legitimate objections and concerns raised by I&APs into conditions for ongoing mitigation and prevention during the life cycle of the Project.⁶

12. There is no legal basis provided in the NEMA for such an approach and if it were adopted it would undermine the entire regulatory scheme for impact assessment and mitigation created under section 24 of NEMA, to the detriment of the sustainable development of Saldanha Bay and the imperative to prevent a climate catastrophe.

13. The EAP was required to comply with regulation 23 of the 2014 EIA regulations, as regards significant new information added and/or changes made to the version of the EIA presented to the public for comment. It failed to do so, and failed to advise the competent authority or the public of its assertion (which is disputed) that its technology is so novel that it could not do this assessment before authorisation.

⁵ Parag 33

⁶ Id 32.1

14. Further detailed submissions on need and desirability of the Karpowership project will be set out in Ground 8 hereunder.

Ground 2

The DFFE heavily relied on particular components of the application and did not holistically assess the application

15. It is argued that the decision maker failed to consider need and desirability and recommendations of the socio economic impact assessment.
16. There is no evidence that these parts of the EIA were not considered. The decision maker is not bound to follow the recommendations of the socio economic impact assessment.
17. The socio economic report states:

“It should, however, be acknowledged some negative impacts may arise and that these will largely be borne by households in proximity to the development and the local fishing community, albeit, unlikely after mitigation measures are put in place to reduce negative significance levels.”⁷

18. The socio economic impact assessment did not present a complete picture of how the Karpower project might impact on small scale fishers who are dependent on fishing in Saldanha Bay, including information on the potential loss of livelihoods due to damage to fishing resources as a result of continuous and significant underwater noise for 20 years near to the breeding grounds of threatened fish species. Partly this is due to the fact that the public was not given an opportunity to comment on the further reports on underwater noise obtained from the appellant after the Draft EIA report, and the fact that the extent of the impact on fisheries due to underwater noise was not determined.
19. This ground of appeal should accordingly be rejected.

Ground 3 and 5

GROUND 3: The DFFE considered comments and objections by Environmental groups outside of the PPP timelines and the Applicant through its EAP was not afforded any right of response or reply in contravention of the *audi alteram partem* rule (parag 37 – 40)

⁷ Socio Economic impact assessment paragraph 6.3

GROUND 5: Failure to consider the inputs of the appellant and Triplo4 in response to objections

20. The Appellant refers to Annexures “SB3A” and “SB3B” which it request to be read, *ad seriatum* into the Appeal. It states:

“It is noteworthy that in these inputs, specific reference is made to the threshold of public participation and the Appellant argued at the time that it had met the minimum threshold for public participation.”

21. The issues raised under Ground 5 are also raised under Ground 6, and responses thereto will be addressed under Ground 6 .

22. The contents of “SB3A” and “SB3B” are denied where they differ from this submission and the Green Connection complaint of 30 May 2021.

Ground 4

The DFFE failed to assess the Project in accordance with the provisions of Sec 2(4)(l) of NEMA “There must be inter- governmental co-ordination and harmonisation of policies, legislation and actions relating to the environment”, in that that there was no inter- governmental engagement with regard to the action taken by the DFFE.

23. The appellant provides no evidence on which to base this ground of appeal and it is must be rejected. Arguments concerning the fact that the project was declared a SIP and that it is important to have the RMIPPPP projects deliver electricity to the grid are addressed in the responses to Ground 1, 7 and 8.

Ground 6

The DFFE failed to consider that the Appellant has met the threshold for public participation

24. This ground of appeal is made up of the following contentions, each of which are denied.

- a. DFFE failed to consider the aspects of paragraphs 11 to 33 of the Appellant’s MEMORANDUM which sets out the minimum legislation threshold as well as specific reference to small-scale fishers.⁸
- b. It argues that in doing so it has met the threshold for public participation.

⁸ Paragraph 42

- c. There were no “new” studies submitted in the Final EIAR – the core studies obtained were originally made available to all I&APs, and pursuant to specific objection thereto, further studies were obtained in direct answer to objections raised.⁹
- d. The information added after public consultation is not prejudicial to the I&AP’s;¹⁰
- e. Insofar as “site studies” are concerned, this is impossible at this stage of the Project given that the Project entails new technology introduced into the Republic. There are no existing “Karpowership” sites;¹¹
- f. Clarification from the decision-maker and incorporation of the Appellant’s inputs could have led to the issues raised, as having been incorporated into specific conditions for the implementation of the Project regarding mitigation and prevention;¹²
- g. the Appellant has met the minimum legislated and policy thresholds for public participation which should have been considered by the Appellant prior to a negative decision being made.¹³

Approach to Ground 6

25. In response to the above, this submission will address Ground 6 under the following general headings
- a. Whether the appellant has met the threshold of public participation.
 - b. Alleged failure of the DEFF to consider paragraphs 11 to 33 of the Appellant’s memorandum - the memorandum which included the following issues
 - 1. The legal and policy setting for public participation (memorandum paragraphs 11 – 14).
 - 2. GN 320 of 2020 participation (memorandum paragraph 15 - 18).
 - 3. Chronology of public participation (memorandum paragraphs 19).
 - 4. Karpowership technology and expert studies participation (memorandum paragraphs 20- 32).
 - 5. The individual grounds of suspension participation (memorandum paragraphs 33- 71).

⁹ Id 54.1

¹⁰ Id 65.3

¹¹ Ifd65.4

¹² Appeal paragraph 54.4

¹³ Id 67

6. Alleged impossibility of undertaking studies until the project is operational due to novelty of the technology. (Addressed in paragraph 8 above)

- c. Whether the final EIA contained new studies.
- d. Whether the public was prejudiced by the changes in the final EIA report.
- e. Whether further assessment can be included in conditions of approval.
- f. Mitigation measures for underwater noise.
- g. Constraints on the study of underwater impacts prior to operation of the project

a) Has the appellant met the threshold for public participation?

26. Green Connection disputes the averments contained in annexures SB 3A and SB 3B where they differ from the contents of this submission and its complaint but will not traverse each and every issue raised. All suggestions made by the EAP that she is being personally targeted in this matter targeted are denied. The following issues are included to highlight the failure of the Final EIA report to correctly apply the regulatory requirements for environmental impact assessments under NEMA.

- a. The EAP's letter responding to the Green Connection complaint¹⁴ suggests that for underwater noise, all the key requirements of an EIA under the EIA regulations could be deferred until after the granting of authorisation merely by being mentioned in an EMPR. This would include the baseline assessment, data collection, monitoring and mitigation. See:

"At the conclusion, I made two points. The first was that the issues raised would be considered and included in the EMPR."¹⁵

And

"The results should be widely disseminated and be the subject of ongoing monitoring. This recommendation, together with the other matters such as water temperature and quality monitoring, were carried into the draft EMPR, which was also available for inspection during the comment period. That monitoring would be public, and it was proposed that it would be overseen by a stakeholder forum, on which the fishers would be represented if they so wished. It was inherent in the monitoring programme that if any parameters being monitored were a matter for concern, mitigation measures would have to be implemented. Mitigation for

¹⁴ Annexure SB 3A Letter by H Plomp of Triplo 4 paragraphs 3 and 4

¹⁵ Paragraph 3

exceedances of both above-water and underwater noise was, according to the applicant and Specialists, fully feasible.”¹⁶

- b. This approach, is fundamentally at odds with the specific requirements of the regulations, and is repugnant. Its recommendations undermine the objects of sections 23 and 24 of NEMA and the NEMA principles, which are to prevent significant environmental damage by assessing, and mitigating impacts before they occur. To uphold this approach would defeat the entire purpose of the EIA regulatory scheme.
- c. Further discussion is also contained in paragraphs 123 – 126 below

27. It is disputed that the appellant has met the threshold for public participation, as it did not afford the public an opportunity to comment on significant new information and/or significant changes in the EIA after the public comment period as required by regulation 23(1)(b) of the 2014 EIA regulations. This information took the form of a supplementary assessment, and data on underwater noise undertaken at an existing operational powership in Ghana that was included in the final EIA.¹⁷ Not only does this study present previously unavailable data (to the experts in the EIA) on the underwater noise generated by a powership, but it contains significant information on the underwater sound generated by powerships, the impacts of underwater sound on marine living organisms and mentions the lack of consensus as to the sensitivities of marine life against the harmful URN (underwater noise) caused by the Powerships.¹⁸
28. This assessment in turn led to significant changes in the Specialist Study on Noise Impacts (referred to elsewhere in this submission as the **Safetech** Report) Marine Ecology Specialist study (referred to elsewhere in this submission as the **Lwandle** Report) and recommendations of the Final EIA – including that an assessment of underwater sound impacts be undertaken after environmental authorisation was granted to the project.

¹⁶ Letter dated 18 June 2021 by Triplo 4 - annexure SB 3A page 3. -The Draft EIAR and EMPR

¹⁷ Comments and responses report TRIPLO4 RESPONSE - PAGE 376

“To further clarify the impacts on underwater noise as per the outcome of the public participation, a supplementary assessment on underwater noise was undertaken at an existing operational Powership in Ghana and included in the Final EIA”

¹⁸ GDS study paragraph Section 5

29. The inclusion of these changes prejudiced I&AP's, in particular Saldanha Bay small scale fishers who are dependent for their livelihoods on the sustainable management and protection of declining fish stocks and juvenile fish in the Bay. This prejudice is discussed further in paragraphs 97 – 116.

30. The following statement (underlined) by the EAP Triplo 4 in their submission to the complaint is vague and obfuscates the issue. It is not clear what is meant by "addressed".¹⁹ Both experts stated that a study could not be done at that stage as there was no data.

Underwater noise impacts were identified as an issue, were included in the Plan of Study, and were addressed during the EIA phase in the Marine Ecology Specialist Report by Lwandle Marine Environmental Services (now trading as CLS Southern Africa), and in the Safetech Specialist Study. Both of those reports were included in the draft EIAR and were advertised as part of the documents available for inspection and comment during the draft EIAR comment period 26 February to 31 March 2021

Re MEMORANDUM paragraphs 19 - Disclosure of information to small scale fishers

31. The MEMORANDUM states that

"The small-scale fishers are recorded as part of a unique focus group at paragraph 1.1.1, and engagement with them has far exceeded even the minimum legislated threshold described above."

32. This is disputed.

33. The GDS R&D TECHNICAL REPORT (GDS noise report),²⁰ which was supplied by the appellant was received by the EAP on 17th April 2021.

34. At the meeting on 19th April 2021 the persons present from the small scale fishing community raised concerns as to the impact of underwater noise on fish, stompneus and

¹⁹ DFFE Ref: 14/12/16/3/3/2/2006 COMPLAINT FROM GREEN CONNECTION REGARDING THE PROPOSED GAS TO POWER POWERSHIP PROJECT AT THE PORT OF SALDANHA BAY SALDANHA BAY LOCAL MUNICIPALITY, WEST COAST DISTRICT, WESTERN CAPE -18 June 2021

²⁰ GDS R&D TECHNICAL REPORT OF THE KARPOWERSHIP'S TERRESTRIAL AND UNDERWATER RADIATED NOISE (URN) EVALUATION - Dr. Ismail Cicek - supplied by the appellant

particularly juvenile fish was raised. The Triplo 4 representative advised them according to the minutes that :

“There has been an evaluation of the noise and it is not expected that this noise will have any significant impact on the breeding grounds of the fish, and this will be confirmed in writing.”²¹

35. They were advised in writing as follows, somewhat ambiguously

“Die effek van geraas en vibrasie op mariene ekologie word was ondersoek en daar word verwag dat die werksaamhede van die projek laer onderwater geraas te weeg bring as ander groot vragkepe.”²²

36. Apart from being ambiguous as to whether the noise is being or has been evaluated, this information gives no inkling that significant new information had been obtained from the appellant and incorporated into the two expert reports and Final EIA, and that a study of the potential noise impacts would only would be conducted once the project operational. Further that mitigation would only be considered after the plant was operational.

37. It follows that requirement of “three general functional categories of public participation” as described in the appeal was not complied with namely “**education/information, review/reaction and interaction/dialogue.**”²³

38. Further discussion of public participation will be included in 97 -116 below

b) Alleged failure of the DEFF to consider paragraphs 11 to 33 of the Appellant’s memorandum - the MEMORANDUM included the following issues

39. Appellant in paragraphs 43 – 47 of the appeal argues that the DFFE failed to consider the aspects of paragraphs 11 to 33 of the Appellant’s MEMORANDUM which sets out the minimum legislation threshold as well as specific reference to small-scale fishers. ²⁴ It argues that in doing so it has met the threshold for public participation.

40. No evidence has been put forward that the DFFE failed to consider paragraphs 11 to 33 of the Appellants MEMORANDUM. The DEFF decision to suspend the EIA process on 19th April 2021 was consistent with a proper consideration of the complaint, and the appellants

²¹Minutes of the KARPOWER Focus Group Meeting with Subsistence and Micro Fisheries - contained in Appendix D14 of the Final EIA Small Scale Fisher Engagements date 19th April

²² Letter dated 25th April from Triplo 4 contained in Appendix D14 of the Final EIA Small Scale Fisher Engagements.

²³ Appeal paragraph 53

²⁴ Paragraph 42

answering memorandum and attached documentation, and a correct determination of the issues. This argument is therefore rejected.

41. As regards the appellant's Memorandum responding to the DEFF decision to suspend the EIA process, we will address this document under general headings, but will not traverse each and every statement. Where there are assertions in conflict with the Green Connection complaint,²⁵ they are to be regarded as being denied.
42. The memorandum addresses the following issues
 - i. *The legal and policy setting for public participation (memorandum paragraphs 11 – 14)*
 - ii. *GN 320 of 2020 participation (memorandum paragraph 15 - 18)*
 - iii. *Chronology of public participation (memorandum paragraphs 19)*
 - iv. *Karpowership technology and expert studies participation (memorandum paragraphs 20- 32)*
 - v. *The individual grounds of suspension participation (memorandum paragraphs 33- 71)*

Public participation - Re MEMORANDUM paragraphs 11 - 22: Further consultation was not unreasonable:

43. Firstly, is denied that the Green Connection complaint was vexatious, abusive or misleading in any respect. The memorandum responding to it is replete with defamatory, untrue and argumentative statements against what is nothing more than the exercise of a constitutional right to fair administrative action by an organ of civil society acting in the public interest, and in the interests of protecting the environment. The Green Connection reserves the right to address these defamatory comments in the appropriate forum.
44. It is denied that the process of consultation has been unreasonable or that the Appellant has been "hamstrung" thereby.²⁶ As envisaged under regulation 23(1)(b) of the 2014 EIA regulations, the addition of significant new information and/or changes to the report, after public consultation on the Draft EIA necessitated a further 30 day consultation period.

²⁵ Green Connection complaint in terms of regulation 13 of the EIA regulations, as amended, dated 30 2021

²⁶ Memorandum paragraph 14

Re MEMORANDUM paragraphs 15 – 18: The underwater noise impact assessment was not regulated by the protocol in GN 320 of 2020

45. The appellant states that in terms of GN 320 of 2020 - *Procedures for the Assessment and Minimum Criteria for Identified Environmental Themes* in terms of Section 24(5)(a) and (h) and 44 of the NEMA, only “available information” on underwater noise needed to be studied and this was undertaken by the EAP.

46. This regulation does not apply to underwater noise. It does not mention and it is disputed that it applies thereto. In the absence of explicit clarity, the interpretation of statutes requires words to be interpreted in the context in which they are found, according to the judgment in the case of *Natal Joint Municipal Pension Fund v Endumeni Municipality 2012 4 SA 593 (SCA)* at paragraph 18:

“Interpretation is the process of attributing meaning to the words used in a document, ... having regard to the context provided by reading the particular provision or provisions in the light of the document as a whole and the circumstances attendant upon its coming into existence. Whatever the nature of the document, consideration must be given to the language used in the light of the ordinary rules of grammar and syntax; the context in which the provision appears; the apparent purpose to which it is directed and the material known to those responsible for its production. Where more than one meaning is possible each possibility must be weighed in the light of all these factors. The process is objective not subjective.”²⁷

47. The context in this case is a protocol that aims to streamline environmental impact assessment using regulatory thresholds that are already in existence for controlling noise. Above ground (or terrestrial) noise levels are regulated extensively in residential, industrial and workplace environments, and therefore it is reasonable to place some reliance on these regulations to reduce the scope of study of noise in an EIA. Noise underwater is not regulated in South Africa.

48. Furthermore all features of this protocol suggest that the intention of the legislation is to regulate above ground noise, as evidenced by the following:

a. The screening protocol does not refer anywhere to underwater noise.

²⁷ *Natal Joint Municipal Pension Fund v Endumeni Municipality 2012 4 SA 593 (SCA)*

- b. It refers to “the land” and in this context to “the site” and to “site sensitivity” On the ordinary meaning of words²⁸ this can only be interpreted as meaning a land based site. The ocean is not a site.

Prior to commencing with a specialist assessment, the current use of the land and the potential environmental sensitivity of the site under consideration as identified by the screening tool must be confirmed by undertaking **site sensitivity verification**.

- c. The regulation states that the “site sensitivity verification must be undertaken through the use of (a) a desk top analysis (b) using satellite imagery; a preliminary on-site inspection; and (c) any other available and relevant information...”
- d. All of these references to inspection are only feasible and appropriate in regard to above ground or terrestrial sites. Satellites would be useless at detecting underwater noise and site visits equally inappropriate.
- e. All references to regulations for the control of noise promulgated contained in the protocol are to SABS standards provided for under the Standards Act are references to above ground noise regulation.
- f. When it comes to minimum content requirements these all refer to SABS above ground noise regulations. Only in the case of low impact is there no reference to SABS. The inference can nowhere be drawn that this protocol refers to underwater noise
- g. The protocol uses “use of land **and** environmental sensitivity.” Land use is a term that is particular to land use planning and not the ocean. There are two requirements that must be fulfilled ie land use **and** environmental sensitivity, not just environmental sensitivity.

49. It is clear that the regulation never contemplated underwater noise and the two experts both understood this, as neither of them did a desk top study or site visit for underwater noise, whereas the Specialist Study on Noise Impacts undertook such exercises for terrestrial, ie above ground noise.

Re MEMORANDUM paragraphs 20 - 21 Failure to assess underwater noise impacts

50. The final EIA did not assess underwater noise impacts. These were left to a separate noise study to be undertaken after authorisation.

51. It is disputed that Karpowerships are technology so novel that an assessment of underwater impacts, to the degree necessary for an environmental impact assessment, was impossible. (see further arguments in paragraph 8 above)
52. The appellant's reference to noise levels being "Medium-Low significance after mitigation during operations and of Very Low significance during construction phase"²⁹ per the Specialist Study on Noise Impacts are references to **terrestrial** noise, not underwater noise, as this study recommends a separate report on underwater noise and does not attempt to assess the significance of underwater impacts, leaving that to the Marine Ecology Specialist study.
53. The only assessment of potential underwater noise significance is given in the Marine Ecology Specialist Study as possibly low but qualified by needing further study. This assessment was based on data from only the powership and not the project as a whole, which has not been peer reviewed and is neither credible or consistent. (see Expert report of T Mackenzie-Hoy attached as annexure A).
54. Paragraph 32 of the GDS report states:
"KH (Karadeniz Holding) Powerships meet or exceed the existing vibration or noise requirements defined by the Classification Societies."
55. However, this report has not been peer reviewed and the data generated in Ghana only relates to powerships and not the entire project, including FSRU and LNG related activities. To the extent that any mitigation measures are discussed in the GDS report this information is not an independent study, given that GDS provides consulting services in noise management for ships including Karpowerships.³⁰ The statement is somewhat inconsistent with what is stated elsewhere in the report where it mentions the lack of consensus as to the sensitivities of marine life against the harmful URN caused by the Powerships.³¹

²⁹ Memorandum paragraph 24

³⁰ GDS study 45 item iii(a) of the report.

³¹ GDS study paragraph Section 5

MEMORANDUM - Grounds of suspension

56. The appellant's rejection of the DEFF grounds of suspension is without foundation and contains numerous defamatory statements.

Each ground is addressed in the paragraphs that follow:

57. First Ground of suspension:

“the EAP has failed to ensure that the Environmental Impact Assessment Report (EIAR) sets out the environmental impacts, mitigation, and closure outcomes as well as the residual risks of the proposed activity as required under section 1(2) of Appendix 3 of the EIA Regulations 2014, as amended.”

58. Clearly the fact that the Final EIA recommends that the assessment and mitigation of impacts should take place after authorisation results in non compliance with the above requirement. The required legal methodology was not followed. The approved plan of study did not permit assessment and mitigation after environmental authorisation as suggested by appellant.

59. Second Ground of suspension:

The EAP has failed to promote compliance with the objective of the regulations which according to section 2 is to determine through a consultative process the – (i) nature, significance, consequence, extent, duration, and probability of the impacts occurring to inform identified preferred alternatives; and (ii) degree to which these impacts (aa) can be reversed; (bb) may cause irreplaceable loss of resources, and (cc) can be avoided, managed or mitigated.

60. Obviously these requirements could not be complied with for underwater noise impacts - since the degree to which impacts could be reversed was not intended to be studied until after authorisation, as recommended by the Final EIA report .

61. It is disputed that the EIAR “sets out in detail the nature, significance, consequences, extent, duration, and probability of the impacts”³² as alleged by the appellant as this had not yet taken place for underwater noise impacts.

62. Third Ground of suspension:

³² Paragraph 38 MEMORANDUM

“The EAP failed to conduct a specialist study of the potential consequences or impacts on the environment and marine resources of Saldanha Bay – in particular, those on which small-scale fishers of Saldanha Bay depend for their livelihoods – of underwater noise generated by the ships, prior to submission of the EIAR to the Department of decision making.”

63. This ground of suspension arises as a result of the recommendation of the Marine Ecology Specialist Study (version 5) and Final EIA report that the study of underwater impacts be undertaken over a period of time which would necessary extend beyond the decision on environmental authorisation.
64. The appellant’s contention that this complaint is “patently false and an attempt to wilfully and deliberately mislead the DFFE” is defamatory and is denied. It is also contradicted by appellant in what it states in the paragraphs that follow.
65. The appellant has repeatedly stated that it would be impossible to undertake this study until the project was build due to its novelty. The appellant’s reference to The Avian Basic Assessment study done by Birds & Bats Unlimited is irrelevant given that the interests of small scale fishers concern fish, not birds and bats.
66. In this regard refer to the quote from the Coastal and Estuarine Impact Assessment Report assessment on page 46 of the memorandum concerning available literature on powership noise generation:

“Quantitative measurement of the underwater noise produced in the context of the Port of Saldanha Bay is however required to confirm this.”

And

“It is confirmed that a study will be conducted once the Powership is moored and operational, and additional mitigation measures will be implemented should the need arise (although this is unlikely).”³³

67. Fourth Ground of suspension:

“The DFFE state that the lack of a marine ecological specialist assessment in the EIAR to assess the impacts of noise on marine life in the Saldanha Bay, resulted in I&APs, in particular small-scale fishers, being deprived of fully understanding the potential impacts of the development on their livelihoods.”

68. Green Connection attended the meeting with Triplo 4 on 19th April. The attendees from the fishing community pertinently stated on several occasions that they were not in a position to represent the interests of all small scale fishers and requested a further meeting for this purpose.

69. The statement by appellant that “the noise studies, as elaborated on above, indicate that there will not be a negative impact on marine life” is simply not true and if it was, there would be no need for further studies after the project had become operational. The finding of the Marine Ecologist Specialist study in this regard is a qualified statement, and based on the assumption that noise from the Karpowership project in Saldanha Bay would be based on evidence that has not been peer reviewed, being data obtained by the appellant from a powership in Ghana. The study stated that a further study would be needed in order to better understand the impacts from the project on marine life. The statements in this regard by the Marine Ecologist as indicated in version 5 of the report are as follows:

“Sound propagation from the FPP operations in Small and Big Bay will be affected by the topography of the Port. Sound waves will be absorbed and/or reflected by port structures. If we assume that the powership proposed for the Port of Saldanha Bay is equivalent in sound generation to that moored in Ghana, then effects on the surrounding marine ecology would be unlikely. However, as mentioned, a better understanding of the underwater noise climate in the Port of Saldanha Bay is required to place the noise generated by the powership in context.

It is thus recommended that:

- o A baseline study of the underwater noise climates in the Port of Saldanha Bay is initiated.
- o This information should be combined with the likely powership noise estimates presented above and the impacts of the total noise on the marine ecology should be reassessed.
- o Long-term monitoring (at least 12 months) of underwater noise should be developed and this information should be made available to the wider scientific community.”³⁴

It is concluded that there is **not enough information pertaining to underwater noise and vibration levels from floating power plant ships in the context of the Port of Saldanha Bay to conduct an assessment.** Therefore, general sound levels from commercial vessels and from a powership moored in another location are presented, as are the biological thresholds of sensitive receptors. A quantitative underwater noise assessment is recommended to comprehensively assess the impact on the marine ecology.”³⁵

70. Adverse impacts on juvenile fish will affect adult fish stocks in Saldanha Bay generally and beyond and where small scale fishers fish. The focus on the Big Bay and the location of the powership is not relevant to the entire fishing activities of small scale fishers.

³⁴ Paragraph 3

³⁵ Paragraph 4

71. The appeal refers to the EIA record of public participation which states:

The purpose of the meeting was to present a summary of the project, present specialist findings, discuss the fisher's concerns and queries and address where possible. A succinct memo on the project and specialist findings was captured in Afrikaans and provided to the attendees to be shared with the local fishers."

72. However as stated in paragraph 34 and 35 above, the meeting did not address the significant changes and additional information included in the Final EIA report. This omission, together with the lack of a final marine ecology report, resulted in particularly small-scale fishers, being deprived of fully understanding the potential impacts of the development on their livelihoods.

73. Fifth ground of suspension

"The DFFE state that I&APs, including the small-scale fishers have been deprived of the opportunity of providing comment and making submissions prior to the EIAr being submitted to the Department for decision making."

74. The arguments pertaining to the fourth ground of suspension apply equally to this ground.

a. Sixth ground of suspension

"The sixth ground of suspension advanced by the DFFE states that Reliance has been based on information relating to Powerships in Ghana, in circumstances where topography of the ocean and its impact on sound has not been determined."

b. The above is a factually correct statement. The Marine Ecology Specialist report stated:

"Sound propagation from the FPP operations in Small and Big Bay will be affected by the topography of the Port. Sound waves will be absorbed and/or reflected by port structures. If we assume that the powership proposed for the Port of Saldanha Bay is equivalent in sound generation to that moored in Ghana, then effects on the surrounding marine ecology would be unlikely. However, as mentioned, a better understanding of the underwater noise climate in the Port of Saldanha Bay is required to place the noise generated by the powership in context."

c. However reliance on the part of this recommendation that stated that the effects on the surrounding marine ecology would be unlikely led to the EAP, incorrectly it is submitted, recommending that :

“Based on the findings of the independent specialist studies, the proposed project will not result in significant negative environmental or social impacts provided the mitigation measure recommended by the EAP and specialists, as contained in Section 8 of the draft EIA report and the Environmental Management Programme (EMPr) are implemented.”³⁶

72. Further studies and monitoring of marine noise impacts are not mitigation measures.

d. Seventh and eighth grounds of suspension

The contents of appellants responses to these grounds are disputed. It cannot be assumed that because a project is not yet established, its effects on marine ecology due to noise are impossible to assess, or estimate to the degree required in an EIA. This statement was not put forward in the EIA as a reason not to allow further comment, and as a consequence the public did not get the opportunity to controvert it with scientific evidence. See further submissions in this regard in paragraph 8 above.

e. Nineth ground of suspension

“A specialist study is required to determine the baseline/status quo description describing aspects of the marine environment that may be affected by the proposed development and assess the impacts of the project on the marine environment, inclusive of entrainment.” The EAP has failed to ensure compliance with the EIA Regulations, 2014”

The response by the appellant focusses on the baseline information provided regarding the marine environment generally, and apart from a baseline description of the marine noise environment, which was also required for the EIA.

73. The further submissions regarding the complaint are denied, and the Green Connection reiterates as correct its complaint.

³⁶ Final EIA executive summary at page iv

c) Were new studies submitted to the final EIA report? Did the appellant comply with Regulation 23(1)(b) of the EIA Regulations?

74. The appellant disputes that it failed to comply with regulation 23(1)(b) on the following basis:

- a) The final EIA did not contain significant new information or significant changes.
- b) It was not possible to assess underwater noise impacts until after construction.
- c) The changes were iterations.
- d) The public was not prejudiced by the changes.
- e) The authorisation could be granted subject to conditions.
- f) The underwater noise could be mitigated.

75. Regulation 23(1)(b) of the EIA regulations, 2014 states:³⁷

“23. Submission and consideration of environmental impact assessment report and environmental management programme:

(1) The applicant must within 106 days of the acceptance of the scoping report submit to the competent authority –

(a) an environmental impact report inclusive of any specialist reports, and an EMPr, which must have been subjected to a public participation process of at least 30 days and which reflects the incorporation of comments received, including any comments of the competent authority; or (b) a notification in writing that the environmental impact report inclusive of any specialist reports, and an EMPr, will be submitted within 156 days of acceptance of the scoping report by the competent authority, as significant changes have been made or significant new information has been added to the environmental impact report or EMPr, which changes or information was not contained in the reports consulted on during the initial public participation process contemplated in subregulation (1)(a), and that the revised environmental impact report or EMPr will be subjected to another public participation process of at least 30 days.”

76. The DEFF ground of refusal (b) states:

“The EAP failed to enlist the provision of Regulation 23(1)(b) of the EIA regulations, 2014 as amended, as the EIAR dated April 2021 contains significant changes and/or significant new information which was not contained in the reports consulted on during the public participation exercise before it was submitted to the competent authority for decision making. This then compromises the decision making powers of the Competent Authority as information was not presented to I&AP’s for their consideration prior to decision making.”³⁸

77. The appeal disputes ground of refusal (b).

³⁷ GN dated published in GG

³⁸ Letter from DEFF to Karpowership SA (Py) Ltd, dated 23/06/2021

It states that the FEIAR contains no new studies, and information added was not prejudicial to I&AP's.

“54.1 There were no “new” studies submitted in the Final EIAR – the core studies obtained were originally made available to all I&APs, and pursuant to specific objection thereto, further studies were obtained in direct answer to objections raised. This is in compliance with the iterative process.”

And

“An analysis has been made between the Draft EIAR and the Final EIAR as to the variations thereof, and these do not evidence “new facts” which are “prejudicial” to I&APs.”³⁹

And

“65.3 The information is not prejudicial, on the contrary, the additional information received in response to the comment received indicates that the impacts of the Project are not excessively harmful.”⁴⁰

65.4 Insofar as “site studies” are concerned, it has been reiterated that this is Impossible at this stage of the Project given that the Project entails new technology introduced into the Republic. There are no existing “Karpowership” sites. There are also no competitor sites available, nationwide. The information provided to the I&APs was thus adequate, reasonable and the best available information.”

The Draft EIA report

78. The statement that no “new” studies were submitted in the Final EIAR, and that the core studies obtained were originally made available to all I&APs, is disputed.
79. Firstly, neither the Marine Ecology Specialist study⁴¹ nor Specialist Study on Noise Impacts⁴² contain studies of underwater noise impacts of the Karpowership project, core or otherwise.
80. The Marine Ecology Specialist Study (version 3) presented for public comment as part of the Draft EIA report **did not contain any study of underwater noise from powerships, because it claimed there was no data.** The study presented the potential noise from

³⁹ SB 3B

⁴⁰ It is incomplete information which even at the appeal stage is presented as complete

⁴¹ MARINE ECOLOGY SPECIALIST STUDY G2P DEVELOPMENT, SALDANHA BAY Baseline and Impact Assessment Report PREPARED FOR: Triplo 4REPORT REF.: LT 889 BR & EIA SALDANHA V 3.0 February 2021

⁴² Safetech Study - version 3 : survey date 28/09/2020 - 30/09/2020

large ships. It speculated, based on the noise generated by large ships, that the effects of underwater noise from Floating Powership (FPP) operations on marine ecology are unlikely. It recommended a noise modelling study in order to gain a more quantitative understanding of the noise, but without going into details. It did not make any recommendations for management or monitoring of noise levels.⁴³

81. The Marine Ecology Specialist Study states:

“There is no underwater noise data for FPP ships, and no modelling studies have been undertaken for noise from the proposed FPP operations. Therefore, this section provides information based on estimations of underwater noise from commercial ships. i.e. this is presented as a high-level, non-quantitative assessment. A noise modelling study should be undertaken to gain a more quantitative understanding of the noise produced from vessel operations. “⁴⁴

and

*Table 4.1: A summary of impacts associated with the proposed FPP facility's construction and operation that were identified and assessed.*⁴⁵

Effects of increased noise and vibration levels on the surrounding marine ecology	The impact could not be assessed due to the lack of underwater noise and vibration levels data pertaining to floating power plant ships.
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82. The study mentions that the project creates several sources of underwater noise, and this noise is not limited only to the berthed powerships.

“The potential underwater noise and vibration impacts may arise from the following sources:
 o Noise from the establishment of the berthing, gas reticulation and electrical reticulation infrastructure.
 o Noise from the Power Ships, FSRU and LNG supply vessels (their engines, steam turbines, cooling fans and pumps). The noise will include audible, low frequency and infrasound.”⁴⁶

83. Note that the term “FPP” used in the Marine Ecology Specialist report refers to the berthed powership and FSRU only. No reference is made to noise emanating from LNG

⁴³ Id paragraph 5 - MANAGEMENT & MONITORING RECOMMENDATIONS

⁴⁴ Lwandle Marine Ecology Specialist Report for Draft EIA at paragraph 3.4.4 Impact 4: The effects of increased noise and vibration levels on the marine ecology

⁴⁵ Id paragraph 4

supply vessels (their engines, steam turbines, cooling fans and pumps), notwithstanding the fact that the study refers to all of these activities as sources of underwater noise from the project.

84. The study estimates the noise levels of large ships and based on these figures states:

“Underwater noise source levels from large vessels (<100 m, e.g. container ships) are reported to be at most 190 dB re 1 µPa @ 1 m. Floating power plant (FPP)⁴⁷ operations will probably be below this source level, and this is lower than the SPL thresholds listed above for the protection of marine fauna. Therefore, the effects of underwater noise from FPP operations on marine ecology are unlikely.”⁴⁸

85. Similarly the Specialist Study on Noise Impacts⁴⁹ for public comment did not undertake any assessment of noise. It merely recommends a study of the Saldanha Bay soundscape and potential impacts, and states that underwater measurements using hydrophones should be included in a baseline study. It does not mention any mitigation measures for underwater noise. All mitigation measures, read in context clearly relate to above ground (terrestrial) noise.

86. This study describes how underwater noise that could be generated by the KPS project: includes, but is not limited to, the following:

“An increase in marine traffic during LNG deliveries. The main noise sources will be propeller noise, sonar ranging devices and engine noise transmitted through the hull.
Pile driving when constructing and installing the LNG offloading infrastructure.
Noise that is radiated through the ship’s hull during power generation.
Noise from the suction and discharge of cooling water used on the ship into the harbour environment.”

The final EIA report

87. The changes made to the Draft EIA report after public comment were significant, based on the addition of significant information, necessitating public comment. It is disputed that

⁴⁷ “The proposed floating power generating facility comprises one gas engine powership (a Khan class vessel) and a floating storage regasification unit (FSRU) that will be moored within the Port of Saldanha during the project’s 20-year lifespan. “ Paragraph 1.1 Marine Ecology Specialist report version 3

⁴⁸ Id paragraph 3.4.4

⁴⁹ Safetech Study - version 3 : survey date 28/09/2020 - 30/09/2020

these changes were merely further revisions as argued by appellant, or that changes in the Marine Ecology Specialist report by the addition of a short-term study on underwater noise at a Powership Operation in a port in Ghana constitutes a peer review or update of this report.⁵⁰

88. As stated above neither the initial Marine Ecology Specialist study⁵¹ nor Specialist Study on Noise Impacts⁵² presented for comment to the public contained studies of underwater noise impacts for Karpowerships projects. These two reports were changed after the public comment period in an attempt to cure this deficiency with the provision of actual data by the appellant on underwater noise from a powership. This significant addition in turn led to significant changes in the recommendations of the Marine Ecology Specialist report.

Further significant changes in the Final EIA report which will create underwater noise:

The EIA also includes a further significant change relating to the construction of underwater pipelines, involving excavation of the sea bed, and which will generate underwater noise, but the public was not afforded an opportunity to comment on these changes, nor were they discussed in the Marine Ecology Specialist study or Specialist Study on Noise Impacts noise. See: (changes underlined)

“The subsea gas pipeline connecting the FSRU to the Powership will be routed from the FSRU towards the shore with a land based option set out in front of the Saldanha Bay Iron Ore terminal via a flexible marine hose. The gas pipeline will be mounted on small footings requiring minor civil works to construct and install.

A subsea gas pipeline is proposed to be installed along the toe of the existing dredged slopes between the floating storage regasification unit (FSRU) and Powerships to ensure gas supply for power generation and connected to the vessels via a flexible marine hose riser utilising a 200m corridor. The proposed gas pipeline diameter is 24 inches, equivalent to approx. 60cm (600mm). In terms of the Pipeline End Manifold (PEM) installation, each of the three PEMs needs to be set down on a stable and level foundation. **The seabed surface layer needs to be excavated and levelled to achieve this.** Divers will excavate and level a 10m x 10m foundation area on the seabed at the pre-surveyed PEM position. The excavation will be done using hydraulic spades and 6” pumps, to create a 10m x 10m foundation.

The coordinates for the gas pipeline line are for the planned and anticipated positions however a bathymetry survey will be conducted for detailed engineering design for re-alignment as required within the 200m corridor.

⁵⁰ Appeal paragraphs 84.8 and 84.12 and

⁵¹ MARINE ECOLOGY SPECIALIST STUDY G2P DEVELOPMENT, SALDANHA BAY Baseline and Impact Assessment Report PREPARED FOR: Triplo 4REPORT REF.: LT 889 BR & EIA SALDANHA V 3.0 February 2021

⁵² Safetech Study - version 3 : survey date 28/09/2020 - 30/09/2020

Discussion

89. The scoping report, had stated that the proposed project site is within a sensitive marine ecosystem that could be impacted by the underwater noise from the vessel operations (transmission through the hull, propellers, sonar ranging devices etc.)⁵³ Several interested and affected parties responded to the lack of any underwater noise impact assessment in the Draft EIA.
90. Responding to these complaints the Specialist Study on Noise Impacts was reworked. The final version of this study, annexed to the final EIA report, contains significant new information, as it had been updated by the Karpowership Ghana Noise Study on 22/04/21, which contains **actual data** on underwater noise emissions from a powership, whereas the previous version contained no data at all.
91. On the basis of this data, the Specialist Study on Noise Impacts (version 4) changed its recommendation significantly by stating that the ecological specialist studies can thus use the Ghana study data to evaluate the underwater noise impacts – notwithstanding the fact that this data only emanates from one aspect of the project, namely a berthed powership.

“Subsequent to Version 3 of this report, the client was requested to provide information on a current installation of similar size. The results of a study conducted in April 2021 in Ghana of a similar Powership by GDS R&D and AB MECHENG shows that in the immediate vicinity of the hull of the vessel, the underwater noise does not appear to exceed 110dB at frequencies in the 1/3 octave band scale. The Ghana study only applies to the berthed Powership and not the vessel traffic associated with the operation thereof i.e. LNG deliveries etc. The ecological specialist studies can thus use the Ghana study data to evaluate the underwater noise impacts”⁵⁴

And

“d) A hydrophone system is used to determine the underwater soundscape in the vicinity of the Powership berth, FSRU, LNGC berth, harbour entrance and other sensitive areas in Saldanha Bay to determine the current underwater noise environment. This should commence prior to construction and continue periodically once the operational phase commences.”⁵⁵

⁵³ Page 44 Final Scoping report

⁵⁴ Safetech report version 4 paragraph 7

⁵⁵ Id paragraph 8

92. The Marine Ecology Specialist Study in turn took this information and amplified it, with further scientific information about marine impacts of noise, and significantly changed its conclusion regarding the assessment of likely impacts.
93. The study added reference to further academic studies, regarding underwater noise impacts on marine creatures, and a discussed thresholds for harm to marine creatures. It then added a table of *Proposed injury criteria for marine mammals and fish*.⁵⁶
94. This addition provides the framework the first significant change, which is the consideration of actual data from the Ghana report regarding underwater noise from a powership supplied by the applicant to assess likely underwater noise impacts. Using this data and scientific information the report makes recommendations regarding likely underwater noise impacts. it states:

“If we assume that the powership proposed for the Port of Saldanha Bay is equivalent in sound generation to that moored in Ghana, then effects on the surrounding marine ecology would be unlikely.”

95. The second significant change in the Marine Ecology Specialist Study is the **qualification of this statement** with a detailed recommendation for a further study that it stated would be necessary in order to get a better understanding of noise impacts in Saldanha Bay. The recommendation stated what should be studied and over what interval of time it should be conducted as follows:⁵⁷

- o A baseline study of the underwater noise climates in the Port of Saldanha Bay is initiate
- o This information should be combined with the likely powership noise estimates presented above and the impacts of the total noise on the marine ecology should be reassessed;
- o Long-term monitoring (at least 12 months) of underwater noise should be developed and this information should be made available to the wider scientific community.

96. These are significant changes in the report based on significant new information, and are hence of a nature that necessitates public comment. However no opportunity was given

⁵⁶ Marine Ecology Specialist report final versio *Table 3.7: (Sources: Southall et al. 2019, Collett and Mason 2014 and FHWG 2008).*

⁵⁷ Paragraph 3.4.4 Lwandle version 5

to the public to comment on these changes as contemplated in regulation 23(1)(b) was given. This will be further discussed in paragraphs 97 to 116 below.

d) Was the public was prejudiced by changes in the Draft EIA?

97. The appellant states that no prejudice has been suffered by I&AP's as a result of changes in the Draft EIA report. This is disputed. The public and in particular small scale fishers have suffered prejudice as a result of not being afforded an opportunity to comment on changes in the final EIA and specialist reports as contemplated by regulation 23, prior to consideration thereof by the competent authority, in matters that directly affect them.

98. The appeal in paragraph 62 refers to the judgment in **Earthlife Africa (Cape Town) v Director General Department of Environmental Affairs and Tourism and Another**⁵⁸ at **paragraph 76 in order to expound on the test for the right to comment**. The judgement states

“What is required in order to give effect to the right to a fair hearing is that the interested party must be placed in a position to present and controvert evidence in a meaningful way. In order to do so, the aggrieved party should know the ‘gist’ or substance of the case that it has to meet.”

99. As stated above the initial recommendations of the Marine Ecology Specialist study and Specialist Study on Noise Impacts presented for public comment on the Draft EIA report were was not based on evidence of sound produced by Karpowerships. Such evidence was introduced for the first time in the final report EIA report, and the public was not afforded a right to comment. The public was deprived the right to controvert such evidence.

100. The significant changes in the report after public comment were therefore:

- a. New evidence pertaining to noise generated by Karpowerships (GDS and MECHENG reports)
- b. Changes in the Marine Ecology Specialist study and Specialist Study on Noise Impacts
- c. Changes in the final EIA report based on changes in the above reports.

⁵⁸ (7653/03) [2005] ZAWCHC 7; 2005 (3) SA 156 (C); [2006] 2 All SA 44 (C); 2006 (10) BCLR 1179 (C) (26 January 2005)

101. New evidence relating to noise.

The changes in the Specialist Study on Noise Impacts includes the two additional sources of information supplied by the appellant:

- GDS R&D Incorporated Noise Study on a Karpowership Noise Emissions (17th April 2021)
- AB MECHENG Inspection Certificates of Noise Measurements (April 2021)

102. The public and small scale fishers were prejudiced as they were not given an opportunity to challenge the methodology and conclusions of these two reports. On the basis of the expert report of T.E. Mackenzie Hoy Pr. Eng Bsc(Elec) obtained by Green Connection and attached hereto,⁵⁹ it is submitted that these reports are of no value to the competent authority and should be completely disregarded.

103. Critique of the GDS and MECHENG reports

- a. These reports were obtained directly by the appellant and have not been peer reviewed.
- b. The data is confined to the noise impacts of only one component of the Karpowership project, namely a berthed powership allegedly measured in a port in Ghana. The initial Marine Ecology Specialist Study (version 3) had mentioned the Floating Power Project (ie powership and FSRU). However version 5 of this study gives no consideration to other sources of underwater noise (ie FSRU and LNG) notwithstanding that it identifies these as sources of underwater noise in the project. Neither the cumulative impacts of other noise in the Bay nor cumulative impacts of the project itself are therefore considered, and notwithstanding that the GDS study states:

“Analysis of commercial shipping revealed that distant vessels could account for the measured levels of low- frequency ambient noise (Hildebrand, 2009)”⁶⁰

- c. Data consisting of terrestrial measurements of noise from Karpowerships used in the Safetech Specialist Study on Noise Impacts report to assess terrestrial noise was not presented in the Draft EIA for public comment, but only made available in the Final EIA.

⁵⁹ Registered professional engineer number 840428 - Mackenzie Hoy and Associates Consulting Acoustics Engineers

⁶⁰ GDS Study Parag 1.2

- d. A detailed critique of the two reports by T McKenzie-Hoy shows that they contain material discrepancies relating to both terrestrial and underwater noise, rendering them unreliable for the purposes of environmental impact assessment. Some of the Important aspects include:

The GDS report:

- e. GDS is a Turkish consulting firm who supplied a report entitled: “TECHNICAL REPORT OF THE KARPOWERSHIP’S TERRESTRIAL AND UNDERWATER RADIATED NOISE (URN) EVALUATION.” The report deals extensively with underwater noise which is emitted by ships which are travelling through the water and then in one section, how noise can be controlled by various mechanisms. This is not related directly to airborne or underwater noise from powerships.
- f. The GDS report section on noise from Karpowerships has a number of errors which render the report largely meaningless.
- g. For example there are references to airborne noise emissions which use decibels, which are for underwater noise. Airborne noise is measured in dBA, underwater noise as dB at a distance from a sound source. The report cites emissions from three generator engine types, none of which is the type proposed for the Karpowership.⁶¹

The report of AB Mecheng:

- h. The report of AB Mecheng contains the results of a series of 13 measurements of the underwater noise from a Karpowership moored in Ghana and 3 measurements of airborne noise. None of the underwater measurement is credible. No evidence is presented to show that the measurements are from the Karpowership and not some other source. There are no comparative measurements at the given locations with the Karpowership not operating.
- i. The airborne noise measurements are taken using a sound level meter which is not suitable for environmental noise measurements and which contravenes the

⁶¹ Mackenzie- Hoy expert report at paragraph 2.3

requirements of SANS 10103. The meter is primarily for occupational noise measurements. The sound level meter has no South African National Accreditation Standard calibration certificate and thus the measurements are not valid.⁶² (see further comments below on the Safetech Specialist Study on Noise Impacts)

The Safetech Noise Impact Assessment (NIA).⁶³

104. The Safetech Specialist Study on Noise Impacts study added the following paragraph after the public comment period on the draft EIA report. It concludes that the Marine Ecologist can use the additional information from the GDS and MECHENG reports to undertake a marine impact assessment, a conclusion that is disputed.

“Subsequent to Version 3 of this report, the client was requested to provide information on a current installation of similar size. The results of a study conducted in April 2021 in Ghana of a similar Powership by GDS R&D and AB MECHENG shows that in the immediate vicinity of the hull of the vessel, the underwater noise does not appear to exceed 110dB at frequencies in the 1/3 octave band scale. The Ghana study only applies to the berthed Powership and not the vessel traffic associated with the operation thereof i.e. LNG deliveries etc. The ecological specialist studies can thus use the Ghana study data to evaluate the underwater noise impacts.”⁶⁴

105. The public has not been afforded an opportunity to controvert this conclusion, and to point out that Safetech Specialist Study on Noise Impacts did not undertake an underwater noise study. Its author does not profess to have any qualifications and experience in underwater noise assessment. Nor does the author make any claim to know or understand or plot or predict the noise underneath the water.⁶⁵

106. The Safetech Specialist Study on Noise Impacts author also professes no expertise in the field of acoustic mitigation from ships, and basis its recommendations on questionable data provided by the appellant as discussed above. As stated in the attached expert report:

“There are predicted noise levels and predicted sound power levels and he mentions that GDS., a consulting firm, measured sound pressure levels from a ship in Ghana using an instrument. The instrument is shown in photographs and referred to in the text of the GDS report. It is a Centre 324 instrument. A Centre 324 instrument is a type two instrument, which means it is not sufficiently accurate to be used for legal measurements in South Africa. To measure sound pressure levels for reasons of legal applications or

⁶² Paragraph 2.4

⁶³ Referred to elsewhere in this submission as the Specialist Study on Noise Impacts

⁶⁴ Paragraph 7

⁶⁵ Id paragraph 2(b)

even to meet the Western Cape Noise Control Regulations, a type one or class one instrument must be used. This is specified in SANS 10103:2008 in paragraph five, section two. The Centre 324 is no more use to measuring this than an app, is loaded onto a cell phone. It is not valid for these measurements and then these measurements cannot be accepted.”⁶⁶

107. According to sound contour maps provided by Safetech the report indicates on the maps by means of the key diagram attached to the maps at the Karpowership that it will not emit noise of greater than 100 decibels A-weighted. This assertion is rejected. See further details in attached expert report.⁶⁷

108. Safetech recommends that the underwater soundscape of Saldanha bay be determined by a study. Saldanha Bay has an area of 86 square km (86 000 000 m²) and the accurate measurement of the soundscape would be an exercise of many years give the area, tidal variation, depth variation and temperature and salinity changes. The suggestion is hopelessly impractical.⁶⁸

The Lwandle Marine Ecology study

109. The public was prejudiced by not being afforded an opportunity to comment on these significant changes in this report, arising as a result of the addition of The GDS and MECHENG reports and significant changes in the Safetech Specialist Study on Noise Impacts.

110. Significant changes in the Marine Ecology report include presentation of table 3.7 (see below) which lists underwater sound pressure levels which will cause temporary changes in fish behaviour and underwater sound pressure levels which will permanent auditory injury.

Table 3.7: Proposed injury criteria for marine mammals and fish (Sources: Southall et al. 2019, Collett and Mason 2014 and FHWG 2008).

Species Group	Temporary threshold shift (behavioural changes): Peak SPL	Permanent threshold shift (auditory injury): Peak SPL
Low frequency cetaceans	213 dB re 1 µPa	219 dB re 1 µPa
High frequency cetaceans	224 dB re 1 µPa	230 dB re 1 µPa
Very high frequency cetaceans	196 dB re 1 µPa	202 dB re 1 µPa
Pinnipeds (in water)	226 dB re 1 µPa	232 dB re 1 µPa
Fish	168 dB re 1 µPa	206 dB re 1 µPa

⁶⁶ Id paragraph 2(e)

⁶⁷ Id paragraph 2 (f)

⁶⁸ Id paragraph 2.1 j

111. However the table is merely a proposed set of criteria. It is incomplete for the purposes of the EIA as it does not indicate impacts of noise on the habitat generally, and on which juvenile fish depend that would result from constant exposure over 20 years to noise from the Karpowership project as a whole. This would include impacts on microorganisms and sea grass that fish depend on as they develop.⁶⁹
112. The data presented in this proposed set of criteria is apparently derived from published papers. Three references are provided. Review of the references provided (Southall, Collet and Mason) show that the criteria are not derived from experimental records. The table cannot be reproduced or found in any of the references quoted. The specialist should indicate where this table can be found or how this table was derived.⁷⁰
113. The report provides insufficient information on the effect on marine life for a decision maker. Not enough information is provided. For the report to be useful it should indicate the level at which there is “no behavioural shift” level or “no effect on the fish” level, which would be a level at which the noise levels which fish are not affected. For a detailed discussion of this issue please refer to paragraphs 3.1.d -i of the attached expert report.
114. The report states that provided a power ship in Ghana generates the same noise as the proposed power ships in Saldanha then the effect on marine life will be unlikely. This is not credible and is incorrect. The report states :
- “Sound waves will be absorbed and/or reflected by port structures. If we assume that the powership proposed for the Port of Saldanha Bay is equivalent in sound generation to that moored in Ghana then effects on the surrounding marine ecology would be unlikely.” (Page 47).
- 119 However the ports of Ghana are near the equator, the sea is warmer and the size of the port very different to Port of Saldanha (Ghana Sekondi-Takoradi is 0,730 sq km. Saldanha is 86 sq km) so underwater noise reduction is much increased for the port in Ghana.⁷¹

⁶⁹ <https://www.nature.com/articles/s42003-021-02165-3>

⁷⁰ Id paragraph 3.1.a

115. The report recommends, as did Safetech, that an underwater soundscape of Saldanha bay be determined by a study. This would take a number of years to accomplish and is impractical.⁷²

Further significant changes in the Final EIA report relating to underwater noise

116. The EIA also includes a further significant change relating to the construction of underwater pipelines, involving excavation of the sea bed, and which will generate underwater noise, but the public was not afforded an opportunity to comment on these changes, nor were they discussed in the Marine Ecology or Safetech Specialist Study on Noise Impacts. See: (changes underlined)

“The subsea gas pipeline connecting the FSRU to the Powership will be routed from the FSRU towards the shore with a land based option set out in front of the Saldanha Bay Iron Ore terminal via a flexible marine hose. The gas pipeline will be mounted on small footings requiring minor civil works to construct and install.

A subsea gas pipeline is proposed to be installed along the toe of the existing dredged slopes between the floating storage regasification unit (FSRU) and Powerships to ensure gas supply for power generation and connected to the vessels via a flexible marine hose riser utilising a 200m corridor. The proposed gas pipeline diameter is 24 inches, equivalent to approx. 60cm (600mm). In terms of the Pipeline End Manifold (PEM) installation, each of the three PEMs needs to be set down on a stable and level foundation. **The seabed surface layer needs to be excavated and levelled to achieve this.** Divers will excavate and level a 10m x 10m foundation area on the seabed at the pre-surveyed PEM position. The excavation will be done using hydraulic spades and 6” pumps, to create a 10m x 10m foundation.

The coordinates for the gas pipeline line are for the planned and anticipated positions however a bathymetry survey will be conducted for detailed engineering design for re-alignment as required within the 200m corridor.

e) Could the environmental authorisation could be granted subject to conditions relating to future assessment of underwater noise?

117. The appeal suggests that it was justifiable to assess impacts after authorisation. This is rejected as contrary to the regulatory scheme and precautionary principle. The appeal states:

“54.4. Such clarification from the decision-maker and incorporation of the Appellant’s inputs could have led to the issues raised, as having been incorporated into specific conditions for the implementation of the Project regarding mitigation and prevention. This would have considerable socio-economic benefit, whilst fully considering objections raised.”

⁷² Id paragraph 2.2

118. The recommendation of the Final EIA report that underwater impacts be studied after authorisation a recommendation that is inconsistent with the regulatory regime for impact assessments flies in the face of the precautionary principle. Such recommendation prejudices small scale fishers who should have been afforded an opportunity to comment on it.

119. There can be no doubt that underwater noise can significantly affect the marine environment, as confirmed by both the Marine Ecology Specialist and Noise Specialist studies:

120. The Marine Ecology Specialist Study states:

“The proposed FPP facility in the Port of Saldanha Bay is surrounded by important habitats such as Langebaan Lagoon, Malgas, Jutten and Marcus Islands, the subtidal benthic zone, the water body itself and also aquaculture development zones. These areas could be impacted by the surface noise and the underwater noise from the vessel operations. Underwater noise from human activities is known to have a number of adverse effects on individual aquatic organisms. Effects may arise from exposure to brief high-level sounds and may include death, injury, permanent or temporary hearing impairment or those behavioural responses that may disrupt important life functions (Popper and Hawkins 2016). With longer exposures, chronic effects may occur, including developmental deficiencies and physiological stress (Popper and Hawkins 2016). These may affect life functions, including individual health and fitness, foraging efficiency, avoidance of predation, swimming energetics and reproductive behaviour (Popper and Hawkins 2016).

The sensitive receptors to noise within the Port of Saldanha Bay are fish and marine mammals. To a certain extent, benthic invertebrates may also be impacted by underwater noise and vibration, however evidence is limited. Saldanha Bay acts as an essential nursery habitat for many fish species due to its nutrient-rich waters. Juveniles are considered more susceptible to noise disturbances as they are less mobile, while adult fish (and marine mammals) can move out of affected areas.”⁷³

121. The Specialist Study on Noise Impacts states that any increase in anthropogenic noise could have significant effects on the environment in an ecologically sensitive area.⁷⁴

“Anthropogenic changes to the acoustic environment include increases in the number of high-intensity noise events and chronically elevated and homogenised background sound levels (Shannon et al 2015). Any increase in anthropogenic noise could thus have significant effects on the environment in an ecologically sensitive area.”

⁷³ Marine Ecology Specialist Study paragraph 3.4.4 version 3 and 5

⁷⁴ Paragraph 7.7 Version 4

122. Saldanha Bay fish populations are severely depleted according to the Saldanha Bay “State of the Bay” report commissioned since 2006, as an annual technical report series.⁷⁵ This report highlights several aspects of the bay and monitors change caused by human activity over the year. The 2020 report states:

“The concerning decline and absence of certain species of fish in the Small and Big Bay areas of Saldanha Bay area is summarised in the report as follows:“Recent seine net surveys have documented ongoing **concerning trends in juvenile fish populations** within the Saldanha Bay and Langebaan Lagoon system. (emphasis added).⁷⁶

123. Assessment of impacts after authorisation is in conflict with the regulatory scheme.

124. Section 23 of NEMA read with the NEMA principles makes it clear that environmental impacts of listed activities must be assessed and mitigated before authorisation, and a risk averse approach must be considered, in the absence of scientific information. This is also reflected in the 2014 EIA regulations.

Section 23 (2): The general objective of integrated environmental management is to-
(b) identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative impacts, maximising benefits, and promoting compliance with the principles of environmental management set out in section 2;

(c) ensure that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them;

Section 2(4) states:

Sustainable development requires the consideration of all relevant factors including the following:

(vii) 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; and

(viii) 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.

(r) Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.

⁷⁵ <https://sbwqft.org.za/state-of-the-bay/>

⁷⁶ Executive summary of the 2020 report page xvi

125. The granting of authorisation subject to conditions that are dependant on further expert studies undermines the regulatory objects of NEMA as contained in its principles, and sections 23 and 24 which aim to promote sustainable development and minimise and mitigate adverse environmental impacts.
126. It effectively shifts the onus of proof that the activity will not have a significant effects on the environment to a time after authorisation has been granted, and where the balance of convenience has shifted in favour of the appellant. Significant funds will by then have been spent on the project, and there will be a dependence on the electricity it generates. It will be very difficult for the DEFF to withdraw such authorisation without costly litigation even if underwater noise studies show a significant impact that cannot be mitigated, as the appellant is likely to strongly contest this. The issue of whether mitigation measures are more expensive and challenging to install after the plant has been built is also not traversed in the EIA.
127. The rights and interests of small scale fishers will be prejudiced in the process. Small scale fishers are dependent on the preservation of safe breeding grounds and the sustainable management of habitats for fish on which their livelihoods depend in the Saldanha Bay area. The same applies to farmers who engage in aquaculture in the Big Bay. The breeding grounds of the fish on small scale fishers rely are located close to the shoreline, which is also the proposed location of KPS powerships.

f) Was mitigation of underwater noise impacts feasible?

128. The appeal states that mitigation for exceedances of both above-water and underwater noise was, according to the applicant and specialists, fully feasible.⁷⁷ This is disputed.

129. The appeal states:

⁷⁷ SB 3 at page 3

“88.11 Thus, in the respectful view of the Appellant, there was an adequate assessment of likely noise impacts. Crucially, however, detailed mitigation provisions were provided in the Marine Ecology Report.”

130. The EAP in her letter in response to the Green Connection complaint states incorrectly:

“Mitigation for exceedances of both above-water and underwater noise was, according to the applicant and Specialists, fully feasible.”⁷⁸

131. There are no mitigation measures recommended in the either version of the Marine Ecology Specialist Study. The final version recommends further studies and monitoring, neither of which are mitigation measures.⁷⁹

132. Paragraph 8.4.16.2 of the Draft EIA report indicates under “Mitigation Measures”:

“A marine specialist should be consulted to study the effects of underwater noise emanating from the hull of the ship to determine the noise levels and how the impact on marine life in the Port of Saldanha.”

133. In terms of the 2014 EIA regulations “mitigation” means to anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible.⁸⁰ These measures are required to be applied as part of the EIA ie before consideration for authorisation. Clearly a future study of noise is not a mitigation measure.

134. The EIA regulations require mitigation measures to be included in the environmental impact assessment for presentation to the competent authority. The suggestion that potentially significant impacts can be deferred until after the authorisation is granted would undermine the entire system of integrated environmental management which is the object of NEMA and aims to prevent significant damage to the environment through the consideration of impact assessments and the application of the precautionary principle.

⁷⁸ Annexure SB 3A Letter by H Plomp of Triplo 4 paragraphs 3 and 4

⁷⁹ The Memorandum represents proposed future studies into underwater noise as mitigation measures, which is incorrect as discussed in paragraph XX See for example in paragraph 62 where it states: “Based on the mitigation measures in the Marine Ecology Report, a baseline study of the underwater noise climates in the Port of Saldanha Bay will be initiated.”⁷⁹ And “These mitigation measures and ongoing monitoring commitments were included in the Final EIA Report and will be strictly adhered to”

⁸⁰ ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS, 2014 Government Notice R982 in Government Gazette 38282 dated 4 4 December 2014, regulation 1

135. Appendix 3 to the EIA regulations which deals with the requirements for environmental impact assessment reports states:

Section 1 (2) states that **the environmental impacts, mitigation and closure outcomes as well as the residual risks of the proposed activity must be set out in the environmental impact assessment report.** (emphasis added)

Section 2 states that the objective of the EIA process is, through a consultative process to 2(d) determine the - (i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and (ii) degree to which these impacts - (aa) can be reversed; (bb) may cause irreplaceable loss of resources, and (cc) can be avoided, managed or mitigated; (emphasis added)

136. Neither version of the Specialist Study on Noise Impacts states that under water noise impacts can be mitigated.

137. The Specialist Study on Noise Impacts refers to mitigation in a general, ie non specific way. However when read in context these references clearly relate to terrestrial, ie above ground noise. The study does not mention or recommend any mitigation measures for underwater noise. Also as stated above, the author of the report claims no expertise in underwater noise assessment or mitigation measures from ships.

138. The Draft EIA states that the noise modelling results are valid for the terrestrial impacts only and do not apply to the underwater impacts.⁸¹

139. The following reference to mitigation measures in the executive summary of the initial version (version 4) of the Specialist Study on Noise Impacts can only be a reference to above ground noise since the appellant submits that underwater noise can only be assessed when the project is fully operational. Furthermore the issue of underwater noise is separately identified for a future study in the executive summary, after the discussion of mitigation.

See:

“The noise impacts are re-modelled when the final design of the infrastructure and methods of construction is determined. This will enable extra noise mitigation measures to be determined before the equipment is finally installed.”⁸²

⁸¹ Draft EIA report page 130

⁸² Noise study version 3 – executive summary

This paragraph was deleted in the final version of the Specialist Study on Noise Impacts.

140. In conclusion there are no mitigation measures for underwater noise demonstrated to be feasible, according to the applicant and specialists.

Mitigation measures in the final EIA report

141. Any reference to mitigation measures, contained in the GDS report, were submitted after the comment period on the Draft EIA report. They emanate from a consultancy with a potential interest in developing mitigation measures for Karpowerships generally and are therefore from a source with an interest in the project. The conclusions of their report do are not indicated to have been peer reviewed.

142. The notion that measures to measure and monitor underwater noise contained in the EMPR constitute mitigation measures is rejected as set out above ⁸³

g) Was it impossible to assess underwater noise impacts until after construction?

143. This contention was never made in the Marine Ecology and Noise Specialist Studies presented to the public in the Draft EIA and therefore could not be contested. It is not stated explicitly in the Final EIA and is disputed. See paragraph 8 above.

Ground 7:

The DFFE failed to consider Section 2 principles of the NEMA

144. This ground of appeal is dealt with under Ground 1 and amplified hereunder.

145. The appellant contends that the DEFF failed to consider the socio economic impact assessment, the current energy crisis and other factors, and that it was based on the interests of small scale fishers alone. The is denied. No evidence is advanced to support these allegations. The test is whether the decision is lawful, and rational and there is no evidence that it is not.

⁸³ Draft EIA report page 110

146. Given that there were eight preferred bidders announced by The Department of Mineral Resources and Energy under the Risk Mitigation Independent Power Producer Procurement Programme (RMIPPP) it is submitted that the bid window has demonstrated that the requirements of the RMIPPP, and the policy of promoting an Energy mix can be fulfilled by technologies other than Karpowerships, that have lower carbon emissions, have more local content, and do not harm the fragile marine environment.
147. It is therefore disputed that the decision to refuse the environmental authorisation is “in direct contradiction towards the National Policy directive of an energy mix, as well as the introduction of new technologies to prevent installed inflexible capacity.”
148. As stated in paragraph 148 and Annexure B the Karpowership project is not in accordance with the Integrated Resource Plan 2019 in any event.
149. The rejection of the application for environmental authorisation of a power plant that will contribute significantly to climate change and has potentially significant adverse impacts on the marine environment that have not been fully understood is entirely justifiable.
150. The fact that the KPS has been designated a SIP does not automatically accord it the right to environmental authorisation. The constitutional right to environment envisages balancing the prevention of pollution and sustainable development with justifiable economic development. In the present case the other successful bidders are more environmentally and economically justifiable.

Ground 8:

The DFFE failed to properly assess the impact of the Project being declared a SIP

151. No evidence is tendered that this factor was not “properly assessed”. See Grounds 1 and 7 above.
152. The issue of need and desirability of the Karpowerships project if further ventilated in the paragraphs that follow.
153. Need and desirability has to be assessed against all development goals.

The United Nations Sustainable Development Goals (SDGs) or Global Goals were adopted by all member states of the United Nations in 2015 in the commitment to end poverty, protect the planet and ensure peace and prosperity for all people by 2030. South Africa was one of these nations.

The provision of electricity falls under the SDG 7: Affordable and Clean Energy. Notably, the goals are integrated and an improvement in one area affects the outcome of the other SDG areas. For example, an improvement in SDG 7: Affordable and Clean Energy is likely to lead to an improvement in the other SDGs such as: 1 (No Poverty); 3 (Good Health and Well-Being); 8 (Decent Work and Economic Growth); 9 (Industry, Innovation and Infrastructure); 11 (Sustainable Cities and Communities) and 13 (Climate Action) (page 94 of the EIR).

154. In this case, Karpowerships does not aim to provide affordable or clean energy and its impact on the other SDGs is likely to be negative. Goal 8 will be severely impacted as existing jobs and potential jobs in the area could be compromised. Karpowerships will add to climate change. The cost as submitted by the Green Connection in comments on the draft EIA for Karpowerships⁸⁴ is as follows:

“The Draft EIA report fails to assess the economic cost of the greenhouse gas emissions of the proposed Powerships. The Climate Change Impact Assessment for the proposed Powership at Saldanha Bay, Western Cape admits to the following expected emissions of greenhouse gases:

“Over the expected operating lifespan of the Powership project of 20 years at constant 100% capacity, **cumulative generation emissions are 15.21 million tons CO₂e under the worst-case scenario.**”⁸⁵

The Climate Change Impact Assessment for the proposed Powership at Richards Bay, KwaZulu- Natal admits to the following expected emissions of greenhouse gases.⁸⁶

“Over the expected operating lifespan of the Powerships of 20 years (74 460 operational hours), at constant 100% capacity, **cumulative generation emissions are 19.56 million tons CO₂e.**”

⁸⁴ Dated 30 March 2021

⁸⁵ Climate Change Impact Assessment, for Saldanha Bay page 34

⁸⁶ CCIA for Richards Bay Page 32

The Climate Change Impact Assessment for the proposed Powership at Port of Ngqura, Eastern Cape, admits to the following expected emissions of greenhouse gases.⁸⁷

“Over the expected operating lifespan of the Powerships of 20 years (74 460 operational hours), at constant 100% capacity, **cumulative generation emissions are 19.56 MT CO₂e.**”

Cumulatively, the three Powerships would emit **54.33 million tons CO₂e**. The Climate Change Impact Assessments do not evaluate the social costs associated with these emissions. Economists with the School of Global Policy and Strategy, University of California San Diego, published the updated information about the social cost of carbon:

“The social cost of carbon (SCC) represents the economic cost associated with climate damage (or benefit) that results from the emission of an additional tonne of carbon dioxide (tCO₂). One way to compute it is by taking the net present value of the difference between climate change damages along with a baseline climate change pathway and the same pathway with an additional incremental pulse release of CO₂. The SCC provides an economic valuation of the marginal impacts of climate change. ...

*“The GSCC is the sum of the CSCC values. We calculated CSCC for each set of scenario, parameter and model specification assumptions, and established an uncertainty range based on a bootstrap resampling method (Methods and Supplementary Information) and then aggregated to the global level. The median estimates of the GSCC (Fig. 1) are significantly higher than the Inter-agency Working Group estimates, primarily due to the higher damages associated with the empirical macroeconomic production function, although similar SCC values have been estimated in the past using other methodologies. **Under the ‘middle-of-the-road’ socio-economic scenario (SSP2) and its closest corresponding climate scenario (RCP6.0), and with the central specification of Burke–Hsiang–Miguel (BHM) damage function (short run, no income differentiation) we estimated a median GSCC of US\$417 per tCO₂ (p, 2%; μ, 1.5).**”⁸⁸*

Applying the median GSCC from the 2018 study demonstrates that CO₂e emissions from the three power ships would cause social costs of at least **US\$22.65 billion** (US\$417/tCO₂ x 54.33 million tCO₂).”

155. Need and desirability also needs to be assessed against other commitments for example to aquaculture in the Saldanha Bay area.

156. Aquaculture Development Zone

The potential economic negative impact on the Aquaculture development does not seem to have been assessed. In the aquaculture sector, 663 people are directly employed, with

⁸⁷ CCIA for Ngqura page 31

⁸⁸ Ricke, K., Drouet, L., Caldeira, K., & Tavoni, M. (2018). Country-level social cost of carbon. *Nature Climate Change*, 8(10), 895.

570 (86%) permanent.⁸⁹ Karpower does not provide any indication if women will be employed but 55% of employees in aquaculture are women. Karpower has a category of construction jobs which indicate that 98 skilled black employees and that category could include women. There are no guarantees. In direct comparison, Karpower claims it will employ 133 local citizens whereas the AQZ already employs 663 people.

157. In terms of total jobmonths over a twenty year period, the ADZ will provide 159120 jobmonths while over a twenty year period, Karpower will total 34160.

In terms of skills level, 80% or 530 jobs of ADZ jobs are semi skilled, where as for Karpower, only 4 jobs are categorised as semi-skilled or unskilled. In Saldanha, in 2019 the aquaculture development zone received R50 million investment into the sector, 77% of this was private sector investment. The Figure below shows the investment into the Saldanha ADZ over 2017 to 2019. For the aquaculture sector, approximately R130 million has already been invested⁹⁰.



158. Karpower provided the details of what it was investing into the local economy in its application to the DTIC where it received an exemption from complying with the local content provisions. Although the media has claimed that the Karpower project will cost R218bn over 20 year,⁹¹ the amount that they will actually invest in the local economy is much less.

159. For Saldanha, the total amount that will be invested is actually about R 300 million in infrastructure related to the mooring of the karpowership.

⁸⁹ DFFE - Saldanha Bay open day presentation – DFFE World ocean day presentation of the Saldanha

⁹⁰ DFFE -Saldanha Bay open day presentation – DFFE World ocean day presentation of the Saldanha Aquaculture Development Zone – 15th June 2021.

⁹¹ <https://www.bloomberg.com/news/articles/2021-03-26/karpowership-s-record-south-africa-deal-estimated-at-15-billion>

160. Taking the figure of how many jobs have been created for the investment put in shows that while Aquaculture job creation is about R812 per job, Karpower is a very expensive way of creating jobs, at R8782 per job, which are mostly for highly skilled people.

Further significant changes in the Final EIA report necessitating further comment.

161. The final EIA report has now added in an additional paragraph which shows that Shell stands to benefit substantially from the project. IAPs have not been given an opportunity to assess this.

162. On page 19 of the Final EIAR, the EAP refers to Shell as an authoritative source to justify the use of LNG.

“According to Shell SA, “Natural gas is the cleanest-burning hydrocarbon, producing around half the carbon dioxide (CO2) and just one tenth of the air pollutants of coal when burnt to generate electricity”.

163. The general public might have believed that this was adequate justification and an independent reference, added into the final EIA report as an additional paragraph which shows that Shell stands to benefit substantially from the project. IAPs have not been given an opportunity to assess this.

164. Karpowership SA is partnering with Shell SA. Shell is one of the global leaders in LNG supply. They are able to secure LNG from the global market. There is a fuel supply management team and LNG procurement will be arranged. The gas will be sourced from top Shell SA with relevant licenses and permissions for the supplier’s full supply/value chain. The applicant has also indicated that they have received assurances from the gas supplier that the gas will not be sourced from fracking.

165. The Hague court ruled that Royal Dutch Shell (widely known just as Shell) to cut its global carbon emissions by 45% by the end of 2030 compared with 2019 levels.⁹²

166. This revelation raises the issue of the risk of supply. Although Shell has said it will appeal the ruling, this does not guarantee success, and by supplying Karpower with gas, Shell is

⁹² For example: Boffey, D., [‘Court orders Royal Dutch Shell to cut carbon emissions by 45% by 2030’](#), *The Guardian*, 23 Jun 2021.

not contributing to abiding by the court ruling. Over the next twenty years, increasing pressure will arise to address climate change through cutting carbon emissions. Carbon taxes both nationally and internationally are likely to increase, further increasing the risk of ever rising costs due to commitments to twenty years of fossil fuels.

167. This is significant new information added to the final EIA which the public should have been given an opportunity to comment on under regulation 23 of the EIA regulations.

Conclusion

On the basis of the above facts and submissions the appeal should be dismissed.

Liz McDaid.

GREEN CONNECTION

Annexure A



Mackenzie Hoy Consulting Acoustics and Wind Engineers

if you have a problem that nobody else can solve....

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30th July 2020

Application for Environmental authorization/12/16/3/3/2005 Applied for by Karpowership (SA) (PTY) Limited for The Gas to Power Project bat the Port of Saldanha within the Sadhana Bay Local Municipality, Western Cape Province.



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30th July 2020
Rev 3

Application for Environmental authorization/12/16/3/3/2005 Applied for by Karpowership (SA) (PTY) Limited for The Gas to Power Project bat the Port of Saldanha within the Sadhana Bay Local Municipality, Western Cape Province.

Dear Ms. Andrews,

Re: Responses to Appeal by Karpowership: Proposed power generating ships, Port of Saldanha, Port of Ngqura, matter relating to Noise Impact on the Environment

1. Introduction

This document is a record of observations on matters raised in the specialist documents submitted as an environmental impact assessment (EIA) of the mooring and operation of Karpowerships at the Port of Saldanha and Port of Ngqura, South Africa. The document is compiled by Terence Eric Mackenzie-Hoy PrEng (professional engineer registered with the Engineering Council of South Africa, No. 840428). Terence Eric Mackenzie-Hoy is a specialist in electrical power systems and all branches of acoustics and noise control. A curriculum vitae is attached as Annexure A to this letter.

2. Executive Summary

2.1 Comments on Noise Impact Report by Safetech

- a. Karpowership proposes to moor ships with on board power generation at the Port of Saldanha and Port of Ngqura, South Africa. The power output of the ships is ~ 400 MW and up to 25 on board diesel generators will supply power. The generators are rated at 20 Megawatts each.
- b. A noise impact assessment (NIA) was undertaken by Safetech (Dr. Brett Williams) of airborne noise emissions from the ships.
- c. No study by Safetech was conducted of underwater noise generation from the ship which arises from noise transmission through the hull.
- d. With regard to airborne noise an assumption was made in the NIA that the noise from the ships will be a maximum of 74 dBA at 100 m from the ship. This is not possible (see paragraph 2 (g) below).

Safetech uses the above value based on measurements conducted in Ghana by a firm, AB Mecheng, on behalf of GDS, a firm of Turkish noise consultants. The measurements were made with a sound level meter which is not suitable for environmental noise measurements and which contravenes the requirements of SANS 10103: *The measurement and rating of environmental noise with respect to annoyance and to speech communication*, as per section 5 of the standard. This standard does not apply to Ghana but, since it is being applied to South Africa for noise prediction it is relevant.

- e. This sound level meter has no South African National Accreditation Standard calibration certificate and thus the measurements are not valid.
- f. Safetech claims that it does not matter that noise from the ship will intrude into the protected marine environment or the West Coast National park since there are no noise levels restrictions for protected natural

environments. This is in fact incorrect, the matter is referenced in SANS 10103, in Table 2, Note 6.

- g. Safetech confirms that at three locations the SANS 10103 noise rating limits will be exceeded and will this be in breach of the West Cape Noise Control Regulations PN 200. This is an offence in terms of the regulations.
- h. Safetech quotes from the GDS findings that the underwater noise level 1 m from the ship will be 110 dB at octave band frequencies. This statement is meaningless. (see paragraph 2 (b) below for details).
- i. Safetech recommends that the underwater soundscape of Saldanha bay be determined by a study. Saldanha Bay has an area of 86 square km (86 000 000 m²) and the accurate measurement of the soundscape would be an exercise of many years give the area, tidal variation, depth variation and temperature and salinity changes. The suggestion is hopelessly impractical.

2.2 Comments on Marine Ecology Specialist Study for Proposed Karpowerships by Lwandle Marine Environmental Services

- a. Lwandle states that the sensitive receptors to noise within the Port of Saldanha Bay / Port of Ngqura are fish and marine mammals. A table is presented which lists underwater sound pressure levels which will cause temporary changes in fish behaviour and underwater sound pressure levels which will permanent auditory injury. The data is apparently derived from published papers. Three references are provided.
- b. Reading the referenced publications, it was noted that none mentions taxon (types) of fish found in South African waters and the table mostly lists the effect on mammals and not fish. The effect of noise on South African fish is not discussed or mentioned at all.
- c. Lwandle states that provided a power ship in Ghana generates the same noise as the proposed power ships in Saldanha then the negative effect on marine life will be unlikely. This is not credible and is incorrect. (see paragraph 1(j) below for details)
- d. Lwandle recommends, as did Safetech, that an underwater soundscape of Saldanha bay be determined by a study. This would take a number of years to accomplish (see j above).

2.3 Comments on Report of GDS

GDS is a Turkish consulting firm who supplied a report titled: TECHNICAL REPORT OF THE KARPOWERSHIP'S TERRESTRIAL AND UNDERWATER RADIATED NOISE (URN) EVALUATION."

- b. The report deals extensively with underwater noise which is emitted by ships which are travelling through the water and then in one section, how noise can be controlled by various mechanisms.
- c. The section on noise from Karpowerships has a number of errors which render the report largely meaningless. For example there are references to airborne noise emissions which use decibel units, dBA re 1 micro pascal , which a is a metric which applies to underwater noise and not airborne noise. The report cites emissions from three generator engine types, none of which is the type proposed for the Karpowership. (see paragraph 3(e), 3(f) and 3(g) below for details)

2.4 Comments on Report of AB Mecheng

- a. The report of AB Mecheng contains the results of a series of 13 measurements of the underwater noise from a Karpowership moored in Ghana and 3 measurements of airborne noise.

- b. None of the underwater measurement is credible. No evidence is presented to show that the measurements are from the Karpowership and not some other source. There are no comparative measurements at the given locations with the Karpowership not operating. The airborne noise measurements are taken using a sound level meter which is not suitable for environmental noise measurements. The meter is primarily for occupational noise measurements. (see paragraph 2(f) and 2(g) below for details)

e. Detailed Discussion

1. Lwandle Marine Ecology Input

The report lists the following Table 3.7 : Proposed Injury Criteria for Marine Mammals and Fish (page 47)

Table 3.7: Proposed injury criteria for marine mammals and fish (Sources: Southall et al. 2019, Collett and Mason 2014 and FHWG 2008).

Species Group	Temporary threshold shift (behavioural changes): Peak SPL	Permanent threshold shift (auditory injury): Peak SPL
Low frequency cetaceans	213 dB re 1 μ Pa	219 dB re 1 μ Pa
High frequency cetaceans	224 dB re 1 μ Pa	230 dB re 1 μ Pa
Very high frequency cetaceans	196 dB re 1 μ Pa	202 dB re 1 μ Pa
Pinnipeds (in water)	226 dB re 1 μ Pa	232 dB re 1 μ Pa
Fish	168 dB re 1 μ Pa	206 dB re 1 μ Pa

- a. Note that the criteria proposed are just that: proposed. Review of the references provided (Southall, Collet and Mason) show that the criteria are not derived from experimental records. The table cannot be reproduced or found in any of the references quoted. The table references low frequency cetaceans, high frequency cetaceans, very high frequency cetaceans and then other carnivorous mammals and then fish. The low frequency cetaceans, high frequency cetaceans, very high frequency cetaceans and then other carnivorous mammals are all mammals, which are air breathing water creatures and not fish. See (i) below.
- b. In one reference (Collet and Mason) there is mention of the effect of underwater noise from pile driving on fish. However, the fish referenced not fish found in South African waters. Pile driving has a noise which has a frequency spectrum which is predominantly low frequency, not continuous and impulsive. A power ship has a noise which a frequency spectrum which is predominantly low frequency, continuous and not impulsive and the noise is 24 hours a day, continuous and will continue for 20 years.
- c. It is noted the stated criteria cannot be found anywhere in the quoted and referenced documents. The specialist should indicate where this table can be found or how this table was derived.

- d. Further in the table, it gives an indication of the species or the taxon of the various creatures and the sound pressure level relative to one micro Pascal, which will cause temporary behavioural shift in the creatures or permanent behavioural shift. This does not mean that temporary behavioural shift or permanent behavioural shifts should be tolerated. If a shift is temporary it will only become temporary if the fish swims out of the sound field which it in itself may be undesirable. Permanent behavioural shift would be indicative of a process which might lead to the death of the fish and temporary behavioural shift would an effect on the animal.
- e. Instead of levels which predict that fish will be temporality disturbed or permanently disturbed (i.e suffer from a temporary shift or permanent shift) what should be indicated is the “no behavioural shift” level or “no effect on the fish” level, which would be a level at which the noise levels which fish are not affected
- f. We do not know what “no effect on the fish” level is at all. The other levels must be quantified in duration, pitch and frequency content and the table does not help us in this matter. Not enough information is provided.
- g. The noise from the ships could cause the marine animals to stay in place but not reproduce. It could cause the marine animals to migrate, but slowly and permanently. It could cause the young fish to die or to make themselves vulnerable to other species. It could cause the marine animals to be disorientated, to beach themselves, or to merely stay static and not seek food. Communication with the rest of the pod of the marine animals may well be affected. Equally, none of the above may occur but there is no information on this whatsoever.
- h. The statement in this table that these mammals and these fish will have temporary shift or permanent shift without saying what the permanent shift or the temporary shift could possibly be is not enough for a decision. The temporary shift could be all of the above. The permanent shift could be the death of the mammal.

- i. What should be recorded is that mammals do not have a swim bladder as fish do. The swim bladder allows the fish to move vertically up and down by inflation or deflation of the sack. Mammals do not rely on this they swim up and down without regard to a specific swim bladder. Thus fish are much more affected by underwater pressure changes as occurs with underwater noise than mammals. (<https://oceanexplorer.noaa.gov/facts/animal-pressure.html> : *How does pressure impact animals in the ocean?*).
- j. The report states: “Sound waves will be absorbed and/or reflected by port structures. If we assume that the powership proposed for the Port of Saldanha Bay is equivalent in sound generation to that moored in Ghana then effects on the surrounding marine ecology would be unlikely.” (Page 47). This is not correct. The ports of Ghana are near the equator, the sea is warmer and the size of the port very different to Port of Saldhana (Ghana Sekondi-Takoradi is 0,730 sq km. Saldanha is 86 sq km) so underwater noise reduction is much increased for the port in Ghana since the shore and break water will readily diffract and absorb the sound.

2. Safetech Noise Impact Assessment (NIA)

- a. The report of Safetech deals very largely with the effect of the ship and the generators on board the ship on airborne noise above the surface of the sea. It must be born that noise above the surface of any water body cannot and does not intrude into that water body at all due to the very, very different densities and speeds of sound in the different medium. For example, sound in the air travels at 342 meters per second. Sound in the sea travels at about four times that. Thus, it is almost impossible for sound of any nature to intrude into the water to a depth of more than one meter below the water.
- b. Safetech NIA is confined almost entirely to sound generation above water. Safetech makes no claim to know or understand or plot or predict the noise underneath the water. Safetech states that from measurements underwater noise is no more than 110 dB over octave band frequencies. The unit dB is not the correct unit for underwater noise measurement. It should be 110 dB re 1 micro pascal. There are 8 octave band frequencies. We are not given what the noise level is at which frequencies and it is not possible for the noise level to be the same from the 63 Hz band and the other 7.
- c. Safetech practitioner freely admits that terrestrial noise generated by the ship will have a medium to low effect, which he states can be achieved provided mitigation methods are adopted although he makes no claim to being an engineer. He states that the mitigation measures could be the use of acoustic barriers, or louvres, and silencers placed on the 24 exhaust stacks pipes of the generators, each rated at 20 megawatts. It is common these days for people to assume that 20 megawatts, two megawatts and 200 megawatts are more or less the same sort of size of generator. In point of fact, there's probably only one 20 megawatt generator in the whole of Africa, and that would be located on the Karpowership in Ghana. There are certainly no diesel engine electrical generators rated at 20 megawatts in South Africa.
- d. Safetech asserts however, it is not a problem to supply silencers to twenty four 20 megawatt generators, as if this it's simply achieved by choosing the

appropriate silencer. In point of fact, generator silencers for a five megawatt engine, coupled to a five megawatt generator are very expensive and very large, and it would be very difficult to fit to a ship given constraints on physical space on board the ship. To the extent that any mitigation measures are discussed in the GDS report this information is not an independent study given that GDS provides consulting services in noise management for ships including Karpowerships. See page 45 item iii(a) of the report.

- e. The exhaust stack silencer shown in the photographs will assist but will be insufficient.
- f. Thus, Safetech's assertion that "medium low" significance is achieved provided suitable acoustic louvres and silencers are fitted to the ship presumes circumstances that are almost impossible to achieve. Further, Safetech uses in his report, noise levels of dubious or doubtful value, as they emanate from measurements taken by GDS, a consulting that has measured sound pressure levels from a ship in Ghana using an instrument.
- g. The instrument is shown in photographs and referred to in the text of the GDS report. It is a Centre 324 sound level meter for measuring airborne sound. A Centre 324 instrument is a type two instrument, which means it is not sufficiently accurate to be used for legal measurements in South Africa. To measure sound pressure levels for reasons of legal applications or even to meet the Western Cape Noise Control Regulations, a type one or class one instrument must be used. This is specified in SANS 10103:2008 in paragraph five, section two. The Centre 324 is no more use to measuring this than an app, is loaded onto a cell phone. It is not valid for these measurements and therefore these measurements cannot be accepted. There would be nothing to stop the GDS practitioners' reporters or Safetech from doing these measurements in Ghana using a class one meter, which would be suitable for legal and environmental evaluation. However, these meters are expensive and given that the location is in Ghana this may have been a factor in the choice of this inexpensive type two meter. The use of this meter

which is normally used for the measurement of noise as in occupational noise and workplaces, is completely inappropriate.

- h. According to sound contour maps provided by Safetech the report indicates on the maps, by means of the key diagram attached to the maps at the Karpowership noise contours, that it will not emit noise of greater than 100 decibels A-weighted. This assertion is highly questionable. All engines or generators emit noise. In this case, we have 24 of them each rated at 20 Megawatts. From this, if one is to accept Safetech's opinion that the noise from the ship in total is less than one 100 dBA one would have to assume that the each of the generators makes no more noise than a loud television, which would be 80 decibels. This is clearly not so from common experience. Even a small household generator used in South African load shedding conditions generates more than 84 decibels. Twenty four 20 megawatt generators create a noise which is at least comparable to that created by an Airbus A340 which has measured from a distance of 100 meters, which measurements have been taken by our practice on numerous occasions for the purpose of evaluating noise impact on surrounding communities.

3 Comments on Report of GDS

- a. The report deals extensively with underwater noise which is emitted by ships which are travelling through the water and then in one section, deals with how noise can be controlled by various mechanisms. This is not related directly to airborne or underwater noise from powerships.
- b. The section on noise from Karpowerships has a number of errors which render the report largely meaningless. For example there are references to airborne noise emissions which use decibels as the metric, while this applies to underwater noise. Airborne noise is measured in dBA, and underwater noise as dB at a distance from a sound source.
- c. The report cites emissions from three generator engine types, none of which is the type proposed for the Karpowership. The report variously gives data as follows:

- e. Figure 24 is of sound power for a **Wärtsilä WV50DF** generator engine which is given as 17 635 kW which is not the size of the Karpowership generator engines stated.
- f. The silencer is described as being for a **Wärtsilä W18V46** generator engine which is not the same as (d) above and is not the size of the Karpowership generator engines stated.
- g. Further graphs reference the **Wartsila W16V46** generator engine which is given as 19 200 kW which is not the size of the Karpowership generator engines stated.
- h. If the report references different engines to that stated, all of which will have different noise characteristics (as can be obtained from **Wartsila** data base) then it cannot be accepted.



T.E. Mackenzie Hoy Pr. Eng Bsc(Elec)

Registered professional engineer number 840428

**for: Mackenzie Hoy and Associates Consulting Acoustics
Engineers**

Curriculum Vitae



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Mackenzie Hoy Consulting Electrical Engineers

Company profile:

We are a Cape Town based consulting engineering practice, specialising in electrical engineering, acoustics and ground vibration and building wind studies..

We employ one registered professional engineer, a graduate engineer, a technician and support staff:

- T.E. Mackenzie-Hoy Pr Eng Principal Officer
 - Bsc degree in Electrical Engineering, University of Cape Town
 - Registered Professional Engineer with the Engineering Council of South Africa
 - Member South African Institute of Electrical Engineers
 - Member of the Society of Professional Engineers
 - Associate member of the Acoustics Society of America (ASA)
 - Registered as European Professional Engineer (IngPEur)

Our full list of projects runs to fifteen pages. listed below are some of the bigger projects for which we have done electrical design and supervision:

Power Stations:

- 1984: Oranjemund Standby Diesel power station upgrade: 18 000 kW (design and commissioning).
- 1985: Ncora Hydro Electric Power Station : 2400 kW (design and commissioning).
- 1986: Big Bend Swaziland: 1200 kW Hydro Electric Power Station (design, supervision of construction and commissioning).

- 2009/10:Paarl Gravure: New Standby Diesel power station : 7000 kW (design, supervision of construction and commissioning).

Water Treatment: Electrical Works

The following information gives an indication of the scope of some of the water / sewage system / hydraulic works in which the principal engineer or associates were responsible for design and supervision of electrical works.

- 1986: Alice Sewage Treatment Works

- 1985: Elandsjagt Water Treatment works (MV Pumping Equipment supplies and pump starters only)
- 1987: Alice Hospital Sewage Treatment Works
- 1988: Potsdam Sewage Treatment Works.
- 1988: King Williams Town Sewage Treatment Works
- 1988: Umtata Pump Station
- 1988: East London: East Bank Water Reclamation Works (11000 volt MV equipment and standby power system).
- 1986: Ncabeladana reservoir and Pump station (Transkei)
- 1999 :Chief Project Engineer for the following:
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 - Reactor / Vacuum contactor starter for various pumps up to 500 kW, Mossgas.
 - Vacuum contactor / Capacitor starter for Mossgas compressor 11000 volts / 20 000 kW (20 Megawatt)

Other Major Projects

- 1991 : New private hospital, Krugersdorp.
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Power Systems Projects

We have designed power and reticulation systems at all voltages up to 132 000 volts. Many of the Ciskei (Eastern Cape) power lines were designed by ourselves and two power lines in Swaziland were designed by our principal engineer. Note: Only projects > R 1 000 000 are shown.

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- 1998 Shared Energy Management
 Simonstown Co-Generation project
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2. During his employ with Eskom, T.E. Mackenzie Hoy, as Senior Engineer operations, was responsible for the system planning department. This department was involved in the design and supervision of construction of a number of 132 kV and 66 kV power lines and sub-stations, including the East London Colesberg traction line (8 x 132 kV intake sub-stations, 150 km) and the upgrade of the RSA/Transkei 132 kV interconnect.
3. A strength of the practice is our knowledge of power generation. We have designed two hydro stations (3000 kW and 1200 kW respectively), one diesel power station (7000 kW, Paarl Gravure) and re-commissioned one diesel station (18 MW in Oranjemund).
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Curriculum Vitae



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