

Our Ref: J27035

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Dear Mr Barratt

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ESKOM ENVIRONMENTAL IMPACT ASSESSMENT (EIA: 12/12/20/944) FOR A PROPOSED NUCLEAR POWER STATION AND ASSOCIATED INFRASTRUCTURE: COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Arcus GIBB acknowledges receipt of the submission received from the St Francis Kromme Trust discussing the above report. We thank you for your valuable comments and your participation in the Eskom Nuclear Power Station (NPS) Environmental Impact Assessment (EIA) process to date. Your questions and comments concerning the Nuclear-1 have been noted.

YOUR COMMENT (1)

Please note that that this response is written entirely without prejudice and that we retain all of our rights, especially in view of the manner in which this EIA has been conducted and the lack of vital information much of which has been requested previously by this and other organisations.

The following relates specifically to the Thyspunt site, and not to Duynefontein or Bantamsklip, except where specifically stated.

BACKGROUND:

- a) The St Francis Kromme Trust has been serving the greater St Francis and Kromme river areas in respect of environmental needs for nearly thirty years. The aims of the trust are –
 - To encourage and promote environmental awareness in the Greater St Francis area;
 - To preserve and protect the environment and amenities for the benefit of future generations;
 - To encourage the preservation of all flora and fauna, shell-fish, sea-life and bird-life in the area, and the appropriate use of Public Open Space, coastal areas and nature reserves.
- b) The trust has participated fully in this process, despite this we are often not invited to meetings.
- c) The trust is a member of the Thyspunt Alliance and fully supports their separate submission.

RESPONSE 1

- a) to c) Your comments are noted.

YOUR COMMENT (2)

EIA PROCESS:

- a) We have previously advised that we consider the process to be totally flawed and once again stress that our rights are completely reserved and that we do not limit ourselves to what is contained in this letter.
- b) The public appears never to have been informed on the reasons for the choice of Thyspunt in about 1980. It is believed to be for its seismic and geological stability, low population density at that stage, and situation on the ocean for dispersal of cooling water. The original report states that one of the factors for discounting the Coega area was its closeness to the independent state of Ciskei (ludicrous- this requires reinvestigation).
- c) Arguments against Thyspunt are the monumental environmental impact of placing a major industrial plant, across sensitive dunefields, on a piece of pristine coastline, in an established tourism area; development of the St Francis area into a recognized tourism destination; the social impact on the established community; the change of "sense of place"; and the huge cost of associated infra-structure in terms of road up-grade and construction and transmission lines. All other things being equal, the obvious site for a power station in the Eastern Cape is the Coega area.
- d) We note that an agreement has been concluded between the Department of Environmental Affairs (DEA) and the National Nuclear Regulator (NNR) in respect of the assessment of radiation issues. This agreement states that any environmental authorisation granted for a nuclear installation would be conditional on the nuclear licence being in place. The prime responsibility to assess environmental impacts remains that of the DEA but they have effectively "out-sourced" the assessment of radiological impacts to the NNR. Since the Draft EIR made available to the public to comment on does not assess all (mainly radiological matters excluded) the environmental impacts, statements containing the words 'no environmental fatal flaws' cannot be made. This is not acceptable!
- e) We have requested details of how many man hours each specialist investigator spent at each of the sites. Whilst promised, this has not been forthcoming!
- f) Nuclear-1 EIA Draft Reports were not offered in other languages which were requested due to language barriers which obscures informed comment from the IAP's and deprives certain IAP's access to this EIA process.
- g) It is our view that this EIA has not respected the NEMA regulations in terms of independence. This on its own invalidates the full EIA!
- h) How the various components are weighted may have a very significant impact on the outcome of the assessment and the conclusions drawn from it. In our view, details of the methodology applied by the specialists to arrive at their assessment (e.g. with regard to how the various factors are information (sic) in order to assess and comment on the extent to which the methodology employed to prepare the draft EIAR is appropriate and fair. To date this has been refused unless the request is made in accordance with PAIA. This attitude is unhelpful and deliberately obstructive. We reserve the right to submit further comments in relation to this methodology once we have obtained access to those records.
- i) The NEMA regulations require alternatives to be investigated. This has not been done in respect of the sites as Eskom has indicated that they intend using all the sites!
- j) The Final Plan of Study claims to outline the criteria to be used by specialists in estimating the significance of impacts, as required in terms of Govt Notice R385, promulgated in terms of Section 24 of NEMA, and criteria drawn from Guideline 5 of the Integrated Environmental Management Series (Assessment of Alternatives and Impacts), published by the DEA in April, 1998. These criteria are extremely important in guiding specialists in preparing their assessments; the public in guiding their response; and the responsible authority in decision-

making. Like all law, they are open to interpretation, and developers will be looking for grey areas and loopholes. It is crucial that they be clear, comprehensive and consistent and provide a fair reflection of the actual situation on the ground. There is room for scepticism, as will appear below. The PoS lists 12 criteria to be considered, namely, nature, extent, duration, intensity, consequence, probability, significance, cumulative, reversibility, irreplaceability, mitigation measures, and degree of confidence. The list sounds comprehensive and sensible. However, a problem arises over the manner in which these criteria are defined and applied. Some definitions are abstruse and difficult to interpret, whilst several are arrived at through a combination of others, and this can skew the results. The result can be a conclusion which does not reflect the realities on the ground.

- k) The key criteria are extent, duration, intensity, consequence and significance. These are defined in terms of three possible categories: There are three different versions – which is being used? How can the EAP justify such extreme incompetence in the drawing up of such important tables as impact criteria? This is yet another example of the shoddy manner in which this EIA is being handled!
- l) NEMA requires alternatives to be considered. Eskom were requested to have sites at Coega investigated. Their then chairman gave an assurance that this would be done!
- m) Each individual report makes very little reference to the ancillary items such as pipelines, transmission lines, dune bridging. Many of these would normally require total EIAs on their own. Why have these not been included in each report?
- n) The EIA does not to comment on the relevant portions of the Coastal Management Act!

RESPONSE 2

- a. Your comment is noted.
- b. The reasons for the choice of the five site alternatives considered during the scoping process for Nuclear-1, which were identified during the Nuclear Site Investigation Process in the 1980s, was documented in the Nuclear-1 Scoping Report. In terms of the Coega IDZ and it being considered as a reasonable and feasible site alternative, Arcus GIBB was informed by the Coega Development Corporation that the Coega IDZ did not have available space in 2007. Although companies are now pulling out, resulting in space being available, Coega cannot be considered a reasonable and feasible site alternative for the Nuclear-1 EIA. This is due to the the need for micro-seismic monitoring over a period of at least five years to determine its seismic suitability, as there is currently a lack of information in this regard. It would take another five years to generate the same level of seismic information as is currently available for the Thyspunt, Duynfontein and Bantamsklip site alternatives.
- c. Please see our response to point b above.
- d. The scope of the Impact Assessment process in terms of the Nuclear-1 application is clearly defined in the Draft Environmental Impact Report (Draft EIR) and the issues that have been investigated in the EIA process have been identified in terms of the co-operative governance agreement between the NNR and the DEA and in terms of the interpretation of this agreement provided by the DEA. We stand by our statement regarding no fatal flaws having been found at any of the alternative sites.
- e. The methods of assessment that were followed by specialist are included in the specialist reports.
- f. The members of Sea Vista and other disadvantaged communities have been consulted to determine the most effective methods of communication. They have been provided with Afrikaans and Xhosa versions of the DEIR Executive Summary. In view of the low levels of literacy in this community, extensive public meetings have been held to explain the findings of the EIA process. The meetings in Sea Vista were held in English, Afrikaans and Xhosa in order to facilitate understanding. In view of the low levels of literacy in this community, this was

- considered a more effective manner of communicating with the community than providing translations of the a number of highly technical reports.
- g. GIBB notes your comments. However, we stand by our assertion that our assessment is independent and objective and have provided statements of independence in this regard.
 - h. Minutes of the November 2009 integration meeting, at which all specialists were present, have been provided to Cullinan and Associates (legal counsel for the Thyspunt Alliance).
 - i. Alternatives in terms of the Nuclear-1 application are based on site and layout alternatives. In terms of this specific application Duynefontein, Bantamsklip and Thyspunt are considered to be site alternatives. Although ESKOM has indicated that Duynefontein and Bantamsklip may be considered in future applications, such developments will be subject to separate applications for environmental authorisation in terms of the National Environmental Management Act. At that time, the environmental assessment practitioners handling such applications would have to demonstrate that sufficient site alternatives are being considered..
 - j. Your comments are noted. The criteria have been revised in accordance with comments made on the Draft EIR by independent peer reviewers in order to simplify the criteria and make them clearer. In terms of these criteria, significance of an impact is a combination of consequence (or importance) and probability. This is in line with legislation and guidelines that you mention, as well as will internationally accepted EIA practice.
 - k. It has been ensured that all specialists use the same criteria.
 - l. Please see our response to point b above.
 - m. The EIR and the specialist assessments have considered the nuclear power station and all associated infrastructure, including access roads, the High Voltage Yard, a desalination plant, the transmission lines between the power station and the High Voltage Yard, etc. A complete description of these aspects of infrastructure is provided in Chapter 3 of the EIR. They are included in specialist reports where relevant.
 - n. The National Environmental Management: Integrated Coastal Management Act, 2008 (Act No., 24 of 2008) has been included in the Revised Draft EIR.

Additional Responses

b,c, l) The proposal to review the suitability of the Coega IDZ as a future site for a nuclear power station holds many potential advantages, such as being in close proximity to an area of high electricity demand (thereby cutting down on the need for long transmission lines) and the fact that it is already in an area that has been earmarked for industrial development.

However the presence of the Coega fault, which runs across the southern part of the Algoa basin before extending into Algoa Bay near the Coega harbour, means that the Coega IDZ should be considered carefully before proceeding with geological investigations for nuclear siting, which will be necessary to develop a comprehensive geological understanding of the Coega IDZ.

The Coega fault represents the south-easternmost extension of a much larger fault system called the Ceres-Kango-Baviaanskloof-Coega fault system, which extends in an east-west direction for more than 700 km. A palaeoseismic trenching study east of De Rust yielded evidence of an early Holocene (approximately 10,000 years ago) reactivation along the Kango section of this fault system. Evidence suggesting the reactivation of the Coega fault after the Pliocene (the interval from 5.3 – 2.5 million years ago) was found near Port Elizabeth.

The currently available geological data indicates that the Coega fault could be considered to pose a risk with regard to future seismicity. Thus, with the current state of knowledge, the Coega IDZ is not considered to be a feasible site alternative.

e) The request for the man hours spent by the geological specialists at each of the sites is not feasible as the data presented in the Geological Hazard and Seismic Hazard chapters of the EIA, were compiled by a team of geologists and seismologists of the CGS over a period of more than eight years. The compilers visited the sites several times and a number of geologists and geophysicists spent several months, some of them several years, in the field undertaking the geoscientific investigations.

YOUR COMMENT 3

SPECIALIST REPORTS:

Dune Geomorphology:

- The assumption is that the main access route will be from the east. Is it feasible to take the heavy loads for 10 kilometres along unstable dune slack, of high conservation value, which is at times effectively a wetland, possibly subject to debris flow and liquefaction? Full investigation is required!
- No notice is taken of the fact that this was the source of the floods which occurred in November, 2007- what would it cost to mitigate shortcomings?
- The report spends a lot of space discussing ways and means of using the northern access road, across the main Oyster Bay by-pass headland dune system. We were informed that this prospect had been abandoned as not feasible. What is the position?
- Almost no attention is given to what we were advised is the proposed and preferred eastern access road. This is fraught with potential problems which have not been investigated at all. When is this full investigation being carried out?
- The specialist's knowledge is questioned when he had to ask a local (at the meeting on 25 May 2010) which way the water had flowed during the recent floods. This certainly does not indicate an in depth study!
- We had previously suggested that use be made of Prof Fred Ellery of Rhodes University Department of Environmental Affairs – he has detailed knowledge of the by-pass headland dune system, and is able to point out concerns regarding potential debris flow and liquefaction of any road using this unstable sand system for heavy-load traffic. Why was he not consulted?
- It is inexplicable that the specialist neglected to include comments given him by Prof Ellery. Problems with regard to the access road for heavy traffic could be a fatal flaw for the entire project and needs full investigation.
- There is a great deal of uncertainty and risk associated with the eastern access road. Serious work is required before this report should be accepted.
- Due attention must be given to the concerns raised by Prof Ellery. In his report submitted separately and we feel that this complete report must be redone as far as Thyspunt is concerned!

RESPONSE 3

- The assumption is that the main access route will be from the east. Is it feasible to take the heavy loads for 10 kilometres along unstable dune slack, of high conservation value, which is at times effectively a wetland, possibly subject to debris flow and liquefaction? Full investigation is required!

Reply

The Dune Geomorphology specialist, Dr Werner Illenberger, was requested subsequent to the public meeting of 25 May 2010 to investigate the potential for the claimed debris flows and debris flow

deposits as well as the November 2007 flood in St. Francis. The investigations and its outcome is presented as an Addendum to the Dune Geomorphology Report in the Revised Draft EIR. The findings of this addendum is that there is no evidence that the Thyspunt site is subject to debris flows and that the site is not characterised by the geomorphological and slope conditions required for the development of debris flows. The opinion of the above specialist is that the evidence of supposed debris flow deposits provided by Dr Ellery are river flood deposits of sand, some mud, pebbles, and some plant debris, that were entrained and later deposited by the Sand River when in flood.

- The report spends a lot of space discussing ways and means of using the northern access road, across the main Oyster Bay by-pass headland dune system. We were informed that this prospect had been abandoned as not feasible. What is the position?

Reply

The proposed main access route from the east was laid out following close collaboration between the wetlands and botany specialists, Gibb, ESKOM and Ninham Shand in Port Elizabeth, who are the civil engineers consulting on the road design. The final route chosen was agreed to as being the best possible route that would minimize impacts on wetlands. This work was done before Dr Werner Illenberger was appointed to undertake the dune geomorphology investigation.

The northern route would traverse sensitive mobile dunes and fragile interdune wetlands and hence the assessment of this route required extensive investigation. The other routes pass through less sensitive terrain and hence did not require such extensive investigation. As reported in the Dune Geomorphology Report (Appendix E2 of the Draft EIR), there are no impacts to the vegetated dunes along the eastern and western access routes that cannot be mitigated adequately (Section 5.3.2, pages 56-57) as far as issues in the Terms of Reference are concerned. The recommendation that the northern access route should not be pursued was taken in November 2010 after the specialist integration meeting, after all specialist biophysical specialist reports showed that the northern route was the least favoured. The only specialist report that indicated a preference for the northern access route is the Visual Impact Assessment (Appendix E19 of the Draft EIR).

- The specialist's knowledge is questioned when he had to ask a local (at the meeting on 25 May 2010) which way the water had flowed during the recent floods. This certainly does not indicate an in depth study!

Reply

Dr Illenberger, the author of the Dune Geomorphology Report, was asked at short notice (the previous day) to include the November 2007 St Francis Links Golf Course flood event in his presentation at the public meeting of 25 November 2010; such flood events were not in original Terms of Reference of the Dune Geomorphology Report (pages 1-2) which was presented at the particular meeting. He has out of personal scientific interest previously gathered information about this flood event. An interesting and possibly important question is whether flood waters had flowed down multiple water courses, or had converged to form one stream. At the Key Focus Group meeting of 25 May 2010, Dr Illenberger was trying to corroborate with Ms Caryl Logie eye-witness information he had received from Mr Frank Silberbauer regarding the flood event. Local residents are valuable sources of information. Specialists should routinely acquire information from as many sources as possible including local residents, in order to make their reports as comprehensive as possible. All the data acquired, e.g. from existing specialist investigations, like the Ninham Shand report "St Francis Links (Pty) Ltd Flood damage November 2007", have been included in the Addendum Report to the Dune Geomorphology Report. This Addendum Report uses as references as number of personal communications of local people who experienced the flood.

In addition to the Addendum Report, Dr Illenberger adds the following:

1. Dr Illenberger has never in his numerous field visits, including some visits shortly after flood events of the Sand River, seen any debris flows or debris flow deposits. Dr Illenberger has perused the literature and consulted with a number of specialists well-versed in sedimentology and with extensive knowledge of the area, and their unanimous opinion is that the supposed debris flow deposits are conventional river flood deposits of sand, some mud, pebbles, and some

plant debris, made by the Sand River. The quicksands that occur during floods of the Sand River result from lateral or upward pressure of groundwater in some areas. Vehicles are not washed away by these floods; they may settle in quicksands generated by the Sand River when in flood. These statements have been substantiated in the Addendum Report.

2. The November 2007 flood Prof Fred Ellery alludes to was a case of erosion and transport of sediments by strongly-flowing floodwaters along the steep V-drains along the R330, which sediments were subsequently deposited in the style of alluvial fans where flow speed dropped. These floodwaters did not originate from the Sand River. These statements have been substantiated in the Addendum Report.
- We had previously suggested that use be made of Prof Fred Ellery of Rhodes University Department of Environmental Affairs – he has detailed knowledge of the by-pass headland dune system, and is able to point out concerns regarding potential debris flow and liquefaction of any road using this unstable sand system for heavy-load traffic. Why was he not consulted?

Reply

Regarding consultation with Prof Fred Ellery and the “Rhodes Research Group”, Dr Illenberger first contacted Prof Ellery by phone in October 2008. It was agreed that a field visit should be conducted to the sites that Prof Ellery and the “Rhodes Research Group” had studied. This site visit never took place, despite numerous communications from Dr Illenberger. Numerous telephone and e-mail correspondences followed, including other members of the “Rhodes Research Group”: Ms Lauren Elkington, Ms Gillian McGregor & Prof Richard Cowling. When Dr Illenberger requested (and received) from Ms Lauren Elkington her MSc project proposal, Prof Ellery also supplied a document “RhodesUStudyModel.doc” that contained some preliminary results from Ms Elkington’s fieldwork: 16 measurements of surface elevation, groundwater depth, and groundwater electrical conductivity, along a 6 km length of the Oyster Bay Dunefield (the dunefield is 18 km long). This was in May 2009. Dr Ellery requested that no data be used until her thesis was completed; and it was agreed in December 2009 (when the draft Dune Geomorphology Report was being completed) by Prof Ellery and other members of the “Rhodes Research Group” that the below statement should be placed in the Dune Geomorphology Report:

“A study investigating the structure and functioning of the Oyster Bay Dunefield system is being undertaken by a group led by Prof Fred Ellery and involving Gillian McGregor and Lauren Elkington, all from the Department of Environmental Science, Rhodes University; Richard Cowling from the Nelson Mandela Metropolitan University. An MSc thesis entitled “Morphology, patterns and processes in the Oyster Bay Dune field system” by Ms Lauren Elkington is at an advanced stage of preparation. This is a work in progress, and the data collected cannot be presented or discussed here until the MSc is completed. However, if the thesis is completed before the final Environmental Impact Assessment Report is completed, the results of the thesis will be incorporated. This course of action was agreed upon after discussion with Prof Ellery and his group.”

This statement appears on page 34 of the Dune Geomorphology Report, under the heading “2.3.7 Academic investigations currently underway”.

Dr Illenberger checked with Prof Ellery and members of the “Rhodes Research Group” on numerous subsequent occasions regarding the status of Ms Lauren Elkington’s MSc, the last being an e-mail sent on 18 May 2010, to which Prof Ellery replied that the MSc is still not complete, and that the above statement was still valid. Prof Richard Cowling responded in an e-mail dated 24 May 2010, saying that he thought information that would help the EIA should be made available.

At the Key Focus Group meeting of 25 May 2010 in St Francis, Prof Ellery agreed that he should release information and data for inclusion in the Dune Geomorphology Report. A two-hour meeting of Prof Ellery and Dr Illenberger was held on 16 June 2010, but Prof Ellery did not bring his photographs of the supposed debris flows. He promised to e-mail them, and sent three photographs and a brief description on 25 June 2010. Dr Illenberger requested more detailed photographs; he did not receive any, but Dr Pete Illgner kindly supplied further photographs. Prof Ellery was requested to supply the locality of the supposed debris flows and a paper on wetlands in preparation (i.e. unpublished) in an e-

mail of 2 July 2010, and he sent these in an e-mail on 6 July 2010. This paper did not investigate any wetlands in the greater Cape St Francis – Oyster Bay area, and debris flows are not mentioned at all in the paper. Dr Illenberger requested permission to use groundwater levels from the 16 measurements in the aforementioned document “RhodesUStudyModel.doc”. To date (21 July 2010) no reply has been received.

It does not seem that blame for poor communication and correspondence with Prof Ellery & the “Rhodes Research Group” should be placed on Dr Illenberger.

It is stated in the comments of the St Francis Kromme Trust that Prof Ellery has detailed knowledge of the by-pass headland dune system, and is able to point out concerns regarding potential debris flow and liquefaction of any road using this unstable sand system for heavy-load traffic. Dr Illenberger is not aware of any scientific publications on the above-mentioned subjects by Prof Ellery; when asked to provide scientific publications, Prof Ellery said that there were none. If the St Francis Kromme Trust is aware of any formal scientific writings that would form the basis for meaningful scientific debate, the EIA team would value these being made available. Additionally, Dr Illenberger would appreciate a CV detailing Prof Ellery’s experience in the Oyster Bay Dunefield and the greater Cape St Francis area.

The conservation status of the wetlands from a wetlands perspective along the eastern route is covered in the wetlands report.

YOUR COMMENT 4

Geological:

- This report and that on geology & seismology were supposed to be done by Irma Hattingh of the Council for Geo-Science. In fact they were done by Bruce Engelsman of SRK and Johan Neveling of the Council for Geo-Science. No CVs appear for any of these, leading to uncertainty as to their level of competence to handle complex issues.
- The report is dated December, 2009 and was produced prior to the revised terms of reference, and does not appear to address all of the issues raised. For example, there is a requirement to identify and assess the potential impact on beneficiaries and losers, with due consideration of downstream beneficiaries. This does not appear to have been addressed.
- It is requested that the EAP considers whether the report is comprehensive, and prepared in terms of the final terms of reference.

RESPONSE 4

The geological and seismic hazard data presented in the EIA were compiled by a team of geologists and seismologists of the CGS over a number of years. The results of this work were summarised and presented in the Geological Hazard and Seismic Hazard chapters of the EIA, by Mrs E. Hattingh and Dr J. Neveling of the CGS. Mrs Hattingh has been the project manager for various nuclear siting projects at the CGS since January 2002. Dr Neveling has been involved in nuclear siting investigations since December 2007. Updated CV’s of Mrs Hattingh and Dr Neveling are included herewith.

The potential impact of the proposed project/facility on the geological environment is extremely small and a nuclear facility will not have a measurable positive or negative impact on the geological environment (as defined by lithified bedrock and consolidated sediments). Instead the potential impact of the geological environment on the project is significant and the main focus of the geological investigations.

Identification of beneficiaries and losers:

The geological and seismic assessment are undertaken from the point of view of impact of the environment of the development, not in terms of the impacts of the development on the environment. The potential beneficiaries and losers are therefore the project applicants.

YOUR COMMENT 5

Seismic:

- Was the report prepared under the final revised terms of reference?
- The terms of reference requests investigation into the Great Sumatran and South Sandwich Trench.
- The available data indicate that the Thyspunt site has the lowest seismic risk of the three proposed NPS sites, and from a seismic point of view, however within the document there is uncertainty. The need for additional studies is stated on numerous occasions (eg *“there are no disqualifiers for this site. This includes consideration of the Plettenberg and Cape St. Francis faults, although this needs to be confirmed by additional studies.”*, *“ The seismic hazard will be reconfirmed through implementation of the more rigorous SSHAC approach”*, *“ there is a need for further studies and the possibilities of the conclusions of this report changing”* and *“Results indicate that, at this stage of the geo-scientific investigations, the seismic hazard does not preclude a standard export NPS at any of the proposed sites. However additional studies will still need to be completed during the course of the siting process, which may impact and even change conclusions reached to date”*. How can any conclusion be drawn when there is so much still to be investigated?
- Within Chapter 8 there is also uncertainty. It is stated that the Peak Ground Acceleration value that indicates that Thyspunt is suitable as a site for a nuclear power station might change: *“The value does not exceed the PGA of 0.3 g typically used in the seismic design of NPSs, although the value at the Duynefontein site at the 0.3 g threshold. This will necessitate additional geological investigations and implementation of an advanced PSHA that will follow internationally accepted practice, and in particular, will conform to the requirements of a Level 3 study as defined in the SSHAC Guidelines. The above will not only confirm the reliability of the above result, but may increase or decrease this value”*
- The seismic hazard for Thyspunt and the other two areas is explained under section 8.1.2. What emerges, and is described as the primary hazard, is an estimate of the local vibratory ground motion, in other words the expected ground motion should seismic activity occur. This would be as some value of g ($g = 9.81 \text{ m/sec}^2$). For a site to be suitable it appears that a value of less than 0.3g is desirable. This is written as $\text{PGA} = 0.3g$ where PGA is Peak Ground Acceleration. In order to determine the potential local vibratory ground motion for a particular site the magnitude and intensity of possible seismicity needs to be estimated. This is done by evaluating the potential for seismicity that could be caused by fault slip of geological faults that occur in the vicinity of the proposed site. It is not clear if the Plettenberg Bay fault or the Cape St Francis fault were included in the assessment of evaluating the site for the potential for seismicity. This must be confirmed!
- Once the seismic hazard has been developed for a site, it must be determined whether a standard export nuclear power station can be built on the site. The greater the margin between the site seismic design basis (i.e. the demand) and the nuclear power station seismic design basis (i.e. the capacity) the less risk involved. This is particularly so in the case of nuclear power station sites in South Africa where the seismic hazard analysis are still to be confirmed by an international accepted procedure such as the Senior Seismic Hazard Analysis Committee (SSHAC) Level 3 study.
- The report states *“SSHAC level 3 studies are expected to either confirm or supersede the existing palaeoseismic studies and probabilistic seismic hazard analyses that were developed for the sites prior to 2006”*. When will these studies be completed?
- The rating (4) given to this aspect is totally out – either a site is suitable or not. The specialist's comments on the following statement will be appreciated! *“This is an important factor in site selection for a nuclear power station. The seismic values at sites will determine the ability to use a standard nuclear power station design, or whether any additional design work will be required for a non standard plant, which will impact on timelines and costs. Additional time may also imply an inability to meet the increasing demand for electricity over the next two to three years, with potential load shedding as a result”* Load-shedding in the next few year has nothing to do with a project that will take up to 12 years to complete!
- With the uncertainty displayed above, how can meaningful recommendations be made about the most significant factor in the study?

- The requirement of further SSR study indicates that no final decision can be taken on the suitability of Thyspunt at this stage! When will the additional studies be carried out? They are awaited!

RESPONSE 5

Terms of Reference (Bullet 1)

Investigation into the Great Sumatran and South Sandwich Trench (Bullet 2)

The Sumatra Area and South Sandwich Trench represent areas where tectonic activity may cause tsunamis. However, because of their great distance from the three sites they do not form part of the relevant geological environment or site seismic hazard. The impact of these areas were therefore considered and incorporated into the "NUMERICAL MODELLING OF COASTAL PROCESSES" report (which forms an addendum to the Oceanographic Assessment [Appendix E16 of the Draft EIR]).

New Seismic Hazard Studies (Bullet 3, 4, 9 and 10)

The need for additional studies stems from changing requirements in the regulatory environment. The methodology previously used to conduct a PSHA for the three proposed nuclear sites (termed the Parametric-Historic approach), is based predominantly on statistical inference from the seismic catalogue, and was developed to deal with the uncertainty and incompleteness of the seismic catalogues (which is often the case). At the time of implementation the Parametric-Historic approach was peer-reviewed and accepted internationally, as well as by the National Nuclear Regulator.

However, regulations for the siting of nuclear facilities are subjected to a process of continuous improvement and hence the publication of the US NRC published regulatory guide (RG) 1.208 in 2007 had a direct impact on the siting of nuclear sites in South Africa. US regulations represent an important benchmark since there are at present no specific South African regulations regarding the licensing of nuclear power plant sites. Eskom therefore follows the regulations of the United States Nuclear Regulatory Commission (US NRC), which is considered to be the most stringent and detailed (and tested) set of regulations in the world. Also, by following US NRC regulations Eskom will also comply to IAEA regulations (which represents the second of the two sets of internationally accepted regulations used for the siting of nuclear power stations).

RG 1.208 described a new approach to define site specific ground motion and dictated that multiple experts be involved in the geological, geophysical, and seismological data, as well as the need to address the uncertainties that are inherent to all geological and seismological models. The Parametric-Historic approach does not fully conform to the requirements of this newly released internationally accepted guideline and could therefore no longer provide the necessary level of nuclear regulatory assurance. Hence the Seismic Hazard Analysis for the three sites has to be repeated.

The new PSHA represents an improvement on the previous work and will better define and constrain uncertainties contained in geological and seismological models, but does not invalidate the work done to date. Hence the existing seismic hazard results can be used to make recommendations regarding site suitability. The results of a PSHA, which will be done according to the SSHAC Level 3 methodology, will form the baselines in the updated relevant Chapter of a Site Safety Report (SSR). The SSR is a document that is to be submitted to the South African National Nuclear Regulator who will then, based upon this data, decide whether or not to authorise a nuclear installation at any of the sites.

Incorporation of Plettenberg and Cape St Francis faults (Bullet 5)

The Plettenberg Bay fault was incorporated into the analysis of the site seismic hazard, but not the Cape St. Francis fault. The Cape St. Francis fault was considered, but previous investigations indicated an age of 126Ma for the last movement on this fault, and found no neotectonic activity or seismicity associated with it. Therefore, according to the guidance provided in the Code of Federal Regulations in the US NRC document 10CFR100 Appendix A, it was concluded that the Cape St Francis is an old fault with low capability for generating a significant surface rupturing seismic event. Geophysical investigations to trace the Cape St. Francis fault closer to shore proved unsuccessful.

SSHAC Level 3 Studies (Bullet 7 & 9)

Groundwork for the development of a SSHAC Level 3 study first commenced in 2008, but was halted due to financial constraints. This investigation will utilise the input from a multi-disciplinary and multi-national team of scientists. Preparations are currently underway to restart a SSHAC Level 3 study. Several logistical factors still need to be finalised, but it is expected that the SSHAC Level 3 study will commence within a year and take two to three years to complete

The rating of 4... Table 9-74 (Bullet 8)

The rating of 4 refers to the importance assigned to results of the particular study in ranking different site alternatives and not site suitability for each site. Unfortunately determining site suitability is not a simple "yes or no" matter. It entails the characterisation of a complex natural system and the methodologies whereby this is done are constantly undergoing evolution and improvement.

Comment on the statement in Table 9.74: We agree with the statement contained in the first two sentences. The seismic hazard has a huge impact on the suitable engineering design, which in turn impact feasibility, costs and timelines ("This is an important factor in site selection for a nuclear power station. The seismic values at sites will determine the ability to use a standard nuclear power station design, or whether any additional design work will be required for a non standard plant, which will impact on timelines and costs.)

YOUR COMMENT 6

Geotechnical:

- Once again this report and that on geology & seismology were supposed to be done by Irma Hattingh of the Council for Geo-Science. They seem to have been done by Bruce Engelsman of SRK and Johan Neveling of the Council for Geo-Science. No CVs appear for any of these people, leading to uncertainty as to their level of competence to handle complex issues.
- The report is dated December, 2009, which is prior to approval of the revised terms of reference, and does not appear to address all of the issues raised in the terms of reference. For example, there is a requirement to identify and assess the potential impact on beneficiaries and losers, with due consideration of downstream beneficiaries. This does not appear to have been addressed.
- It is requested that the EAP considers whether the report is comprehensive, and prepared in terms of the revised terms of reference. Obviously additional investigation is required!

RESPONSE 6

The geological and seismic hazard data presented in the EIA were compiled by a team of geologists and seismologists of the CGS over a number of years. The results of this work were summarized and presented in the Geological Hazard and Seismic Hazard chapters of the EIA, by Mrs E. Hattingh and Dr J. Neveling of the CGS. Mrs Hattingh has been the project manager for various nuclear siting projects at the CGS since January 2002. Dr Neveling has been involved in nuclear siting investigations since December 2007. Updated CV's of Mrs Hattingh and Dr Neveling are included herewith.

The potential impact of the proposed project/facility on the geological environment is extremely small and a nuclear facility will not have a measurable positive or negative impact on the geological environment (as defined by lithified bedrock and consolidated sediments). Instead the potential impact of the geological environment on the project is significant and the main focus of the geological investigations.

Identification of beneficiaries and losers:

The geotechnical assessment is undertaken from the point of view of impact of the environment of the development, not in terms of the impacts of the development on the environment. The potential beneficiaries and losers are therefore the project applicants.

YOUR COMMENT 7

Hydrological:

- Some time ago, the Local Municipality had a geohydrological survey done (when the bore holes were developed). This included a map showing areas of NO GO development. At the last public meeting, the geohydrologist said he was involved in that early survey. Presumably he will be able to provide the report in full.
- The connection between / interlinking of these needs to be investigated. At present aquifers are able to meet the whole of St Francis Bay's needs. What effect will the NPS have on these?
- The statement that *"There is evidence of a strong link between geo-hydrological conditions and wetlands, particularly at Thyspunt. However, impacts on wetlands are considered separately and to avoid double counting, geo-hydrology cannot be considered to impacts on wetlands."* is disputed.
- This is vital information in the proposed development as the geohydrologist's report clearly indicates NO GO for some areas. Has this been resourced – if not, why not?

RESPONSE 7

1. The specialist indicates that the NO GO map referred to was done by an independent consultant to the municipality (Chris Lomberg) and did not include the Thyspunt site;

2. The local aquifers are interlinked to varying degrees. However, dewatering/groundwater control for the nuclear power station will have no effect on the aquifer supplying St. Francis. Groundwater will not be used for supply to the nuclear power station as desalination of sea water is Eskom's preferred option.

3. The statement is from section 9.28.1(b) of the Draft EIR, in the context of the identification of the key decision-making factors for selection of the preferred site. GIBB stands by this statement. The rationale for this statement is that the geo-hydrological conditions affect wetlands. Impacts on geo-hydrological conditions (i.e. on the groundwater level) may result in secondary and ultimate impacts on wetlands. Changes in groundwater levels in themselves are therefore regarded as the causes of potential impacts on wetlands. It is the ultimate potential impacts on wetlands that are regarded as the impacts of most critical importance, not the causative geo-hydrological conditions.

4. The comment is not understood.

YOUR COMMENT 8

Geological:

- The specialist states *"the proposed project could have a significant environmental impact if it would expose people or structures to potential substantial adverse effects, involving...Surface rupture; subsurface stability;; be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse"*. The specialist is required to investigate fully the surface stability of the Thyspunt site in view of dynamic nature of these dunefields and wetlands.
- What are proposed as mitigation measures should in fact be areas that are required to be investigated further!

RESPONSE 8

Bullet 1

The statement referred to (page 30) is of a generic nature, establishing the geological risks that needs to be considered. Subsurface stability is an area of overlapping interest to the geological and

geotechnical investigations. Hence the geological investigation focussed on bedrock stability, while dunefields and wetlands are covered in the Geotechnical and Dune Geomorphology assessments.

Bullet 2

It is true that many of the mitigation measures proposed in the geological report are atypical. It derives in part from the fact that the potential impact of the geological environment on the project is greater than that of the proposed facility on the geological environment. Hence one of the first steps during mitigation is to ensure that the geological environment is adequately characterised, and addressed in an appropriate engineering design.

YOUR COMMENT 9

Freshwater Supply:

- The flawed social assessment failed to assess the capacity of the Kouga Municipality to provide the basic services that the development will require, as well as its capacity to regulate or mitigate negative social impacts (e.g. squatting).
- We need an assessment of the municipality and their capability of delivery in this regard!
- The specialist comments on the drying up of coastal springs. The report states that these are mainly fed by groundwater from the superficial deposits and are of local importance only. It states *“Use of deep (>100 m) boreholes in the TMG Aquifer away from these springs will minimise impacts. Any such potential impacts will be local, of low significance and have a high reversibility”* It must be confirmed as to how these link up with other aquifers in the area and the potential effect that there could be on existing and potential future uses of these.

RESPONSE 9

Bullets 1 and 2: A detailed assessment of the institutional capacity of the municipality is beyond the scope of this EIA. It is acknowledged that the Kouga Municipality does have service backlogs with respect to sewerage. It is therefore recommended that Eskom and Kouga Municipality must agree on the apportionment of responsibilities for the upgrading of relevant infrastructure prior to the commencement of construction.

Bullet 3: All aquifers in the area are linked to varying degrees. However, Eskom has stated that desalination of sea water is the preferred option for freshwater supply to the NPS and so deep TMG boreholes are unlikely to be developed. The area indicated in the report is the furthest from sensitive environmental receptors. Use of aquifers should be encouraged generally, as a resource is not a resource unless it is used. Test pumping of boreholes on the Thyspunt site showed that drawdown effects from pumping did not propagate beyond about 300 m. Further work would be carried out before any boreholes, deep or otherwise, were developed for use for the nuclear power station. This will include detailed yield testing and updating of the flow model. However, since desalination of seawater is the recommended option, groundwater use for the nuclear power station is very unlikely.

YOUR COMMENT 10

1 in 100 Floodline:

- This study comments on sea and wave levels – Surely the effect of a 1 in 100 storm on the Sand River should be commented on?

RESPONSE 10

An assessment of recent flood events, particularly the November 2007 flood in St. Francis, is included in an Addendum Report to the Dune Geomorphology Assessment (Appendix E2 of the Draft EIR). This assessment found that the most significant flooding did in fact not occur in the Sand River, but in a catchment adjacent to (to the south of) the Sand River catchment. The Sand River and this tributary that caused the November 2007 floods in St. Francis drain away from (east of) the Thyspunt site and would not result in damage to the site itself, but at worst could result in washing away of the R 330.

The above-mentioned addendum assessed the capacity of the culverts underneath the R330 where the Sand River crosses the road and found them to be adequate. However, it is recommended that the culvert should be strengthened, should be well-maintained and should be checked regularly to see that it is not blocked by sand; and that any debris that is caught in them during floods should be removed.

YOUR COMMENT 11

Air Quality:

- This is compiled by E Nortje – no CV is provided! Does he/she meet the requirements?
- The actual gaseous emissions from Koeberg should be available including levels of Strontium, Iodine and Cesium. This information should be included in the EIA together with the specialist's comments!
- Given the vast quantity of releases from KNPS over the last two decades, one would expect some sort of impact on the environment; no matter how many times the nuclear authorities say there are none. Please will the specialist comment on the levels of beta activity in foodstuffs with special reference to foods, fruit, vegetables and the dairy industry

RESPONSE 11

- The Air Quality Assessment was compiled by Dr. L. Burger from Airshed Planning Professionals. His CV was included in Appendix E1 of the Draft EIR.
- A total of 98 different radionuclides were included in the assessment. Emissions for these radionuclides were given for the Areva and Westinghouse designs. They were all used together to calculate the dose. This dose is the sum of doses due to each isotope through inhalation, cloud shine and ground shine. To look only at the emissions and air activities of three radionuclides in isolation does not provide a meaningful and complete impact assessment. Nonetheless, these activities have been included in the report. Tritium is responsible for 98% of the total dose from Koeberg. Strontium-90, Iodine-131 and Cesium-137 combined contribute 1% of the total dose.
- This forms part of a comprehensive health risk assessment around the Koeberg Nuclear Power Station. This information will have to be extracted from the Health Risk Assessment which forms part of the Health Risk Study of the Duynefontein Site Safety Report. Currently, the only available information is contained in the annual Radiological Environmental Survey Laboratory reports, which Eskom submits to the NNR.

YOUR COMMENT 12

Floral:

- The Wetlands and especially Langefontein may in no way be compromised by the planned development either in construction or operation. [Floral –Thyspunt page 6-2, Par6-1-3] The construction of the Facility with its deep foundations will affect the ground water and its levels. A variation in ground water levels will adversely affect the Flora. Possibly the specialist should consider “No Go”?
- The dumping of spoil minus the backfill on previously disturbed sites is deplored—it is doubted that there are enough previously disturbed areas to accommodate all the spoil. This will affect the flora. Please comment
- If the Botanical investigations had been done at other times in the year various other plants may have also been found. This needs more on the ground study and liaison with local botanists.
- Will the specialist please indicate how the proposed mitigation measures will save, for example, a population of *Satyrium hallackii* subsp *hallackii*, or *Merxmullera cincta* subsp *sericea* from extinction if the water in the dune system dries up after the power lines or roads have been put across that system? Both those species need those wet conditions.
- No cognisance is taken of the fact that the area is currently a conservancy. Why not?
- The list of flora found on the site is not contained in the study and needs to be produced.

RESPONSE 12

- A year long groundwater monitoring programme is currently ongoing, and is planned to be completed by November 2010. The purpose of this investigation is to determine whether mitigation measures proposed in the Wetlands Assessment (Appendix E12 of the Draft EIR) would be effective at preventing impacts on wetlands due to the drawdown of groundwater during the construction phase of the development. Should this monitoring indicate that mitigation is not possible, it is likely that the no-go alternative will be recommended with respect to wetlands.
- The flora will only be affected if dumping occurs on natural areas. The Flora Assessment (Appendix E11 of the Draft EIR) recommends that heavily degraded sandstone fynbos in the north of the site should be used. With satisfactory mitigation, NO natural vegetation should be disturbed in this process. Furthermore, the Draft EIR recommends that spoil should be disposed primarily in the ocean in order to limit the amount of spoil disposed on land.
- Sampling at other times of the year does need to be conducted. However, the floral assessment has built up a good picture of the main habitats and their rarity and sensitivity, and this was used to inform site location and fine-tuning.
- The floral specialist has not recommended ANY access across the mobile dune system due to the highly sensitive nature of the system and the uncertainty surrounding mitigation. Note that wet conditions would in all likelihood persist regardless of whether these routes are pursued. However, if the functioning of the dune system is severely compromised then wet areas might diminish. Any action that leads to loss and seasonality of water in the transverse dunes will compromise the functioning of the transverse dunes-wetlands interface and lead to (local) losses of these and other species
- The Thyspunt site is not included in the conservancy. I understand that Eskom is not a member of the conservancy – one cannot be co-opted into a conservancy – one has to become a signatory to a conservancy – Eskom to comment?
- Extensive species lists are included in several Appendices to the Flora Assessment in the Revised Draft EIR.

YOUR COMMENT 13

Freshwater Ecology:

- This report shows real concern for the conservation value of wetlands in the area surrounding the proposed site, and was a scientific analysis of the situation and of problems raised.
- It states that in the site and immediate surroundings there are wetland systems that are of high ecological importance, relatively unimpacted and considered to be unique systems that are unlikely to be represented in their present form and complexity elsewhere in the world. It is stated that the conservation status from a wetlands perspective, is extremely high and any threats to their integrity are viewed as of high negative significance. It must be explained why this was ignored!
- It further states that *“Development at this site would be associated with the greatest number, intensity and complexity of impacts to important wetland systems. The main impacts assessed include:*
 - *Permanent loss and degradation of coastal seep wetlands as a result of dewatering/groundwater diversion, concentration of groundwater flows and proposed new roads*
 - *Risks of impacts to the Langefonteinvelei and its associated hillslope seep to the south, as a result of possible draw-down effects*
 - *Fragmentation, infilling and physical disturbance to duneslack wetlands in the Oyster Bay mobile dune system as well as to wetlands immediately north of the Oyster Bay dunefield, as a result of impacts associated with the proposed passage of transmission lines, roads and potential options for sediment transport across the dunes*
 - *Potential infilling and fragmentation of important valley bottom wetlands to allow the construction of access routes to the site, as well as laying of sewage and water pipelines*

- *Degradation of depressional and other wetlands as a result of transporting excess spoil over the dunes to the HV platform.*
- The report states “*impacts are likely to result in significant degradation of a system that presently exists as a relatively unimpacted mosaic of terrestrial and wetland habitats, with high levels of interconnectivity and high overall biodiversity value, to which the wetland systems make a significant contribution*”. The cumulative impacts of the proposed development of a single NPS at the Thyspunt site without implementation of mitigation measures has been assessed as of very high negative significance.
- At a Key Stakeholders Focus Meeting Dr Liz Day, who had prepared the report, repeated these concerns, which indicate that from a wetlands perspective, Thyspunt is a very unfortunate choice of site.
- The comment was that that the controlled conservation area around the site would protect wetlands from future development. This despite the fact that the area is already a conservation area. The impression gained was that she had been briefed by Eskom or Arcus Gibb to draw this conclusion, which was not her own. It is simply not credible!
- The proposal from the floor was that protection of the wetlands would be best achieved by declaring the area a RAMSAR site. There were experts present who confirmed that this is what should happen, and that steps would be taken to try to achieve this if the site was rejected. Why was this not commented on?
- Establishing a protected area is not mitigation. The mitigation suggests the establishment of an expanded protected area in the affected landscape. This is an offset – it is not mitigation! Should the development impact negatively on wetlands and dunefields (as the consultants have said it will), then what purpose will this protected area serve? We agree that the area should be protected (calls for improved protection go back to the early 1980s). Indeed, given its unique features, the land should be included in a protected area as part of the coastal cluster of the Baviaanskloof mega reserve
- It is obvious that this report gives a clear indication that Thyspunt is not a suitable choice for a NPS.
- The report indicates that the bypass dunefield and wetlands of the site are globally unique. The establishment of a nuclear facility on the site flies in the face of SA’s commitment to international conventions regarding biodiversity and wetlands, as well as local legislation (Biodiversity Act of NEMA) which requires that critical support areas (such as the dunefields) and wetlands should be safeguarded. Will the specialist please explain why she is prepared to **jeopardize** these globally unique biodiversity and ecosystems?
- A prevailing and powerful paradigm in natural resource use is the notion that natural ecosystems provide services of great value (monetary or otherwise) to humankind. Yet the reports failed to quantify the value of the sites ecosystem services and build this into a comprehensive benefit-cost analysis. In today’s world, where we are beginning to appreciate the folly of the wholesale replacement of natural capital by man-made capital, this is simply unacceptable. Ecosystem services provided by the site include provisioning services such as water (the dunefield comprises a discrete catchment with an excellent supply of potable water. This could be sustainable and be used to supplement the region’s water supply from the Kromme dams. Obviously this would have to be fully investigated and the results should be included in this report.
- There should be a peer review of Dr Day’s findings, with particular emphasis on the credibility of the mitigation measures proposed.
- The report must be expanded to take into account and explain the points raised!

RESPONSE 13

Response to comments on Ramsar status for site

The Wetland Specialist fully agrees that the wetlands and the associated dune system should form part of a Ramsar site – this is noted in the EIA wetlands report. Ideally, accordance of Ramsar status should have taken place outside of any development proposal. Unfortunately, the proposed Nuclear-1 development is the largest of several developments already planned for the area. The size of the proposed conservation area, and the active conservation management of this area that would be incumbent on Eskom into the future, would however not preclude according RAMSAR status to the

area even with the establishment of a nuclear power station . One of the requirements for RAMSAR status is in fact formal management of the site. The wetlands report recommends that, if the development is approved, this aspect must be pursued by Eskom.

Response to other comments

All of the rest of the comments made in this submission appear to centre on a difference of opinion regarding the implications of a “no development” scenario for the wetlands and their associated ecosystems on the Thyspunt site, and the misconception that the wetlands report is prepared to jeopardise critically important wetlands on the site. In order to address these issues, it is necessary to examine the Wetland Specialist’s assessment rationale and approach to mitigation.

The wetlands report identifies a number of significant information gaps and uncertainties, particularly regarding surface / groundwater linkages, which have resulted in the recommendation that the “no development” option should be applied to the Thyspunt site.

However, the report notes that the “no development option” is also associated with a strong likelihood of impact to the wetlands on and off the site. Existing developments, including small holiday houses within the Eskom site, as well as those adjacent to the site to the east, have all resulted in some level of degradation to the wetlands in their vicinity. Activities associated with degradation include abstraction (including the creation of weirs and reservoirs in wetland areas), the spread of alien plant material into wetlands, *ad hoc* construction of roads / causeways across wetland flow pathways; the construction of fences across wetlands and dune areas; *ad hoc* passage of vehicles through dunes and uncontrolled trampling and grazing of cattle through wetlands. In the wetlands to the east of the existing site, existing (approved and partially implemented) development rights will permit further fragmentation of the so-called eastern valley bottom system. The expansion of other cluster-type development along the area to the east of the site, between the Oyster Bay dunefield and the Thysbaai dunefield is likely, and would contribute to piecemeal fragmentation and degradation of the system as a whole.

Such impacts would not, however, be likely to threaten the large-scale function of wetlands such as the Langefonteinvelei. These wetlands would, however, *possibly* (in the opinion of the Wetland Specialist, *probably*) function at a lower ecological status class, as a result of encroaching development. By contrast, the present levels of uncertainty regarding (in particular) the position and size of the Nuclear footprint; the detailed interaction and direction of flow movement between nearby wetlands and the underlying aquifers, and the feasibility of designing a system that effectively limits the radius of draw-down, suggest that there is currently a significant risk that the proposed Nuclear-1 development could result in outright loss of function of the Langefonteinvelei, as well as affecting a large proportion of coastal seep wetlands. Given this, the wetlands report recommended the “no development option” and accorded the proposed development a high negative impact significance rating.

However, given the conservation problems inherent in the “no development” option, the report also noted that, should the uncertainty regarding wetland / geohydrological linkages be resolved, such that it can be shown **with high confidence** that neither the mobile dune wetlands, nor the Langefonteinvelei wetlands will be affected by drawdown (i.e. these important systems will **not** be jeopardised) and that impacts to the coastal seeps can be significantly reduced, then there is scope to consider the development in a more positive light.

Such an assessment assumes that the above aspects can be guaranteed, and that all of the additional setbacks and on-site mitigation measures referred to in the report are applied. In order to address the certainty of residual impacts to coastal seep wetlands, however, the report recommends offset mitigation – namely, the inclusion of a significant extent of the duneslack wetlands associated with the Oyster Bay dunefield, as well as the “eastern” valley bottom wetland system, from the site boundary to its point of passage into the St. Francis Links golf estate. In order to achieve this, the wetland report specifies that the erven shown in the attached figure, east of the site, would all need to be acquired, and managed exclusively as conservation areas. The erven would need to be acquired before new developments result in permanent ecosystem impacts on these sites. The expanded site would

include nearly all of the Oyster Bay dunefield, and its mosaic of duneslack wetlands. The dunefield would not be crossed by any new roads, and the hydrological connectivity of the dunes to its dependent wetlands would remain intact.

The Wetland Specialist considers that active conservation of a significant extent of these wetlands and their ecological support areas is adequate offset mitigation for the inevitable loss / degradation of coastal seep wetlands that would be associated with the proposed Nuclear 1 development. Degradation of these wetlands is moreover also considered a reality in terms of the no-development option– all of the coastal seeps in proximity of the existing houses on the site have been impacted to some or other degree by human activities.

The attached map indicates the area that would be included in the conservation area, in the event that the development was approved. However, the positive rating accorded to the development applies only in light of the current information gaps being adequately filled, and such information supporting the view that the proposed development does not pose any threat to the ongoing functioning of the Langefonteinlei and the Oyster Bay duneslack wetlands, and that all other mitigation measures are considered feasible, and enforceable.

As stated at the recent stakeholder workshop, additional hydrogeological and wetland ecosystem data are currently being collected at the site, to inform areas of current uncertainty. The impact of the Nuclear-1 development will need to be re-assessed in light of these data, which will also inform detailed mitigation design. External peer review of the assessment of the implications of the new data would be encouraged, in light of the common objective of both this specialist and the above commenting body, of finding the best mechanism to ensure the conservation of critically important wetland ecosystems.

YOUR COMMENT 14

Vertebrate Faunal:

- This report states that impacts on these ecosystems of establishing infrastructure cannot be adequately predicted at present. Thus, the establishment of a nuclear facility on the site flies in the face of South Africa's commitment to international conventions. If it can't be predicted then there is a flaw and this must be investigated.
- Establishing a protected area is not mitigation. This report suggested as mitigation the establishment of an expanded protected area in the affected landscape. This is an offset – it is not mitigation. Should the development impact negatively on wetlands and dunefields (as the consultants have said it will), then what purpose will this protected area serve? We agree that the area should be protected (calls for improved protection go back to the early 1980s). Indeed, given its unique features, the land should be included in a protected area as part of the coastal cluster of the Baviaanskloof mega reserve.
- To merely state under "*Destruction of natural habitats and populations*" that the nature of this potential impact will be similar to that at Duynefontein and is therefore not repeated does not take into account the differing landscape.
- The specialist must state how their mitigation factors are expected to be of any assistance (mitigation is defined as to moderate (a quality or condition) in force or intensity; alleviate or to become milder.)

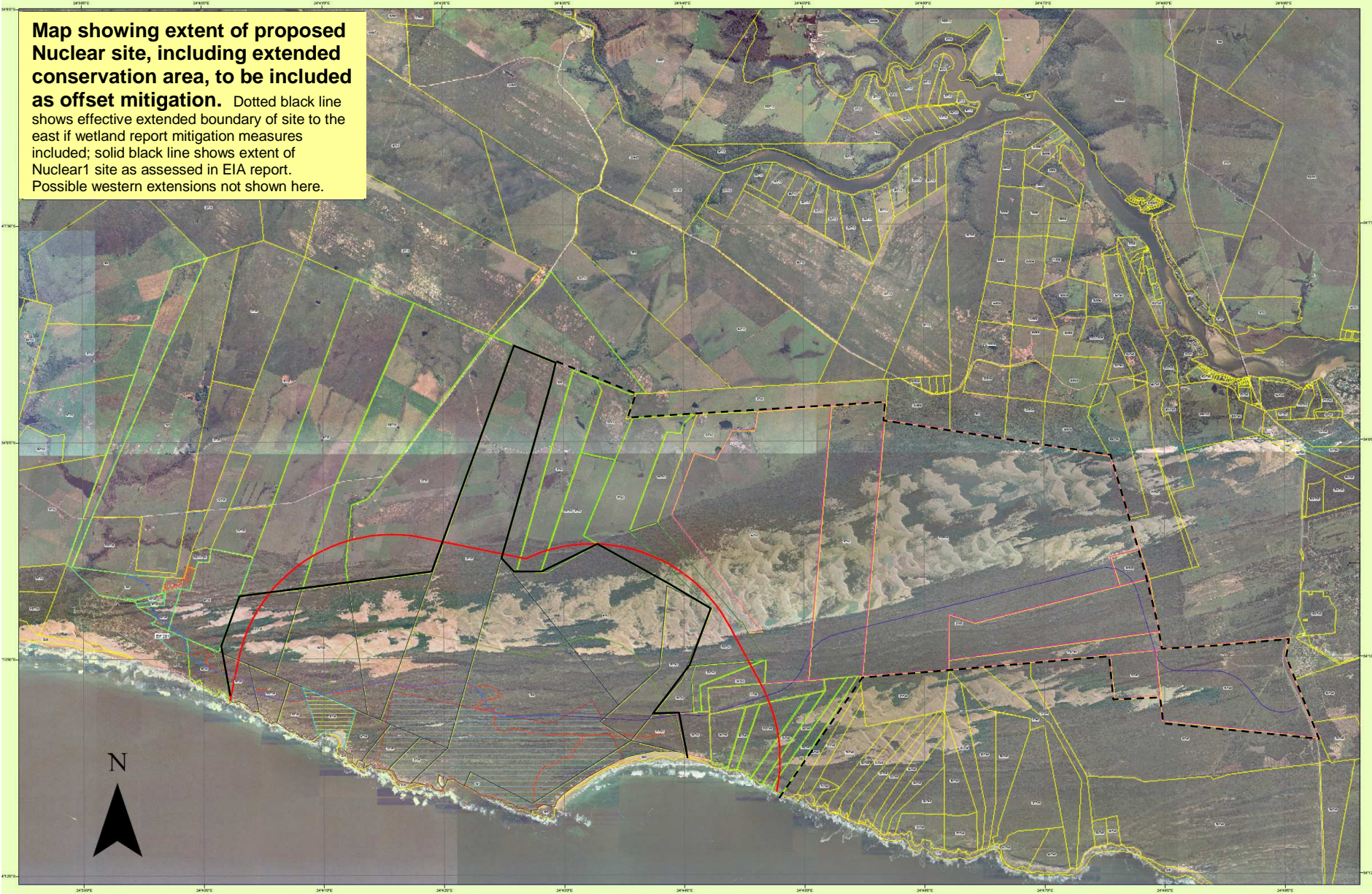
RESPONSE 14

1st bullet: The Vertebrate Fauna Assessment (Appendix E13 of the Draft EIR) concludes that additional information on the interaction between groundwater flows and wetlands is important to confirm the prediction of these impacts.

2nd bullet: The establishment on on-site or offsite conservation areas are well-established mitigation measures in EIA practice. Whether the establishment of conservation areas are regarded as "mitigation" or "offsets" is a matter of semantics. The fact is that the Thyspunt site is currently in a relatively poor conservation state and that the proper conservation of the site, and the acquisition of

Map showing extent of proposed Nuclear site, including extended conservation area, to be included as offset mitigation.

Dotted black line shows effective extended boundary of site to the east if wetland report mitigation measures included; solid black line shows extent of Nuclear1 site as assessed in EIA report. Possible western extensions not shown here.



areas that regarded as important for conservation, will improve the conservation status of the ecological system. Such improved conservation management will mitigate the other negative impacts on the site,

3rd bullet: We take note of your comment. The description of the impact in the Faunal Impact Assessment is identical and repetition of this description in the Draft EIR is therefore not necessary.

4th bullet: All specialists indicated the significance of impacts **with** and **without** mitigation. The difference in the significance of an impact with and without mitigation is an indication of how the mitigation is of assistance to moderate the impacts.

YOUR COMMENT 15

Invertebrate:

- Establishing a protected area is not mitigation. This report suggested as mitigation the establishment of an expanded protected area in the affected landscape. This is an offset – it is not mitigation. Should the development impact negatively on wetlands and dunefields (as the consultants have said it will), then what purpose will this protected area serve? We agree that the area should be protected (calls for improved protection go back to the early 1980s). Indeed, given its unique features, the land should be included in a protected area as part of the coastal cluster of the Baviaanskloof mega reserve.
- The specialist must state how their mitigation factors are expected to be of any assistance.

RESPONSE 15

Please refer to Response 14 above.

YOUR COMMENT 16

Marine Ecology:

- Right from the beginning of this process the existence of the squid fishing industry was brought to your attention and despite this only passing uninformed comment is made. At the public meeting the specialist admitted to having failed to consult the Independent Scientific Study Group set up by MCM to monitor and research the Squid Industry - this would have radically altered the specialist's findings. The report has not taken proper account of the impacts on the squid fishery
- The proposal to dump spoil at sea is a major threat to the entire squid and fishing industry. This in turn could affect the economic report on the overall economic impact of the proposed development.
- The negative impact as a result of the pumping of the spoil on the offshore (1-2 km) is not fully addressed. Over time it will affect both the inshore and offshore environments. If only the nearshore environments have been studied then the full impacts of this project on the Marine Ecology have not been properly assessed and the limited scope of the study leaves a huge portion of the affected area without proper assessment. This consequently leaves the EIA Draft report and process flawed or lacking!
- The release of this hot water together with the turbidity and sediment factor is likely to collapse this environment. Although the specialist has stated that it is theoretically possible it is the norm in the environmental and ecology fields to always take the scientifically more favoured Precautionary Approach. This report rather refers to this as "*unsubstantiated*." The Scientists, Resource Managers and Industry involved in managing this fishery have, from the early days, insisted on the Precautionary Approach when scientific evidence is vague or lacking and this is why this sensitive fishery is still healthy. Surely this must be fully investigated!
- The specialist states "*...the fear of negative market perceptions [relating to radioactive contamination of squid] appears to be mitigable. The production and distribution of scientific evidence should be sufficient to dispel such perceptions*". When will this scientific evidence be produced? This needs to be investigated before such statements are made
- The report mentions an exclusion zone and that this will not be implemented and that access will be allowed. How can assumptions such as this be made? Is this not a government security requirement?

- It is clear that this report needs to be reviewed in the light of information available from the scientific working group and a totally new study done. This clearly has major implications for the Economic Assessment.

RESPONSE 16

Response from the marine ecology specialists:

The squid fishery is given due attention in the Marine Impact Assessment (Appendix E15 of the Draft EIR). The marine ecology specialists have done this using the most up-to-date and scientifically sound published information available. Indeed, the report has not included meetings or interviews with community leaders or role players. We have however gone to great lengths to contact the relevant scientists working on squid. We need to base our assessment on hard science and fact. By remaining impartial to the desires of the developer and emotions, needs and wants of affected parties we can best provide a rigorous assessment which accurately reflects the potential impacts of this development on the marine environment. Additional published information and input from squid experts has been incorporated into the report. As marine scientists considering marine ecology impacts associated with the Nuclear-1 development we are required assess the impacts on the squid as a species (a biological issue) and not the impacts on the fishery (an economic issue).

The marine ecology report considered all habitats which may be affected by the disposal of spoil. Please refer to the very detailed oceanographic modelling report (Appendix E16 of the Draft EIR), which addresses this question and is available for comment as part of the EIA documents. As fully explained by the marine ecology report, the site for disposal was very carefully chosen so as to minimise ecological impacts.

The scientific evidence upon which the assessment of the thermal plume and the disposal of spoil associated with the development is neither vague nor lacking (see full descriptions in the marine ecology report and the report detailing modelling of the sediment disposal options). The assessments are detailed and have been based on published scientific research and over 20 years of experience at Koeberg Nuclear Power Station. It would be irresponsible of us, not to mention unethical, to base our assessments on data or information that is not published, peer reviewed and accepted by the scientific community. As such, the marine ecology report is based on strong information sourced from both the South African marine science community and international published works and it is not necessary to apply the 'Precautionary Approach'.

Over twenty years of experience at Koeberg Nuclear Power Station has shown no radiological contamination of marine organisms (see details in marine ecology report). Nonetheless, it was recommended in our report that monitoring of marine organisms (and particularly squid at Thuspunt) be included in mandatory environmental monitoring following the construction of a power station. It is expected that results from this monitoring would dispel fears of radiological contamination.

The information included in the report regarding the exclusion zone was provided by Eskom. It is our understanding that there is a legal requirement that Eskom be able to protect the power station from attack from the sea and land. As the station will be offset from the coast, this will be possible with a smaller exclusion zone than the one currently imposed at Koeberg Nuclear Power Station.

Following the May 2010 Key Focus Group meeting in St. Francis, considerable effort has been put into the assessment of the potential impacts on the squid at the Thuspunt site. All relevant scientists in the field have been contacted and the very latest published information is currently being incorporated into the next version of the marine ecology report, which is to be provided for comment together with the Revised Draft EIR. There is no valid reason for the study to be redone and it has already been peer-reviewed and approved by another prominent and independent specialist.

YOUR COMMENT 17

Emergency Response:

- This report is dated 3 December, 2009, some seven weeks before approval of the final terms of reference. Once again, the EAP is requested to obtain confirmation that the report conforms to the revised requirements.
- The DEIR conformity with DEA letter to Arcus Gibb, 19/11/08 requires that emergency planning is included. This is left out and needs attention.
- Likewise, the DEIR conformity with DEA letter to Arcus Gibb, 19/11/08 requires that the evacuation plan details are to be conveyed to the public – this has not been done!
- It is written by Mogwera Koathane of SRK, whose qualification is “Pr Sci Nat”. No CV is given for such a person, and it is not possible to determine his/her level of experience.
- The entire assessment is based on the assumption that Generation 111 technology will be used with a 3 kilometre zone. In the absence of any decision to use Generation 111, and government’s confirmation that this will not be used, this is challenged.
- It is completely contradictory and illogical to state that there is no need for short-term emergency intervention outside 3 kilometres, and then state that NPS should not be placed close to population centres. Either they are safe, or they should have more stringent emergency planning provision. The nuclear industry cannot have it both ways. This contradiction must be sorted out!
- We will require scientific evidence that there is no danger outside the 3 kilometre area.
- We will also require specific information on routine emissions, which fall outside the scope of this report. These must be from an independent source.
- In the absence of a decision on specific technology, no valid conclusions can be drawn regarding emergency response. This entire study requires to be redone!

RESPONSE 17

1st bullet: As with all specialist studies, most of these studies commenced well before the approval of the Revised Plan of Study for EIA. This is common practice in EIAs, particularly in the case of biophysical assessments, which require the collection of sufficient and appropriate seasonal data.

2nd bullet: The Emergency Response Report was included as Appendix E26 of the Draft EIR.

3rd bullet: In terms of the emergency planning zones that will be applicable to Nuclear-1, evacuation will be applicable to an 3km radius around the proposed nuclear power station. Planning for emergency evacuation within this zone (in terms of restrictions on densities and capacities of roads) will be determined in details when the proposed emergency evacuation plan is submitted to the National Nuclear Regulator for its approval.

4th bullet: Mr Koathane’s CV has been placed on ther Eskom and GIBB’s project websites and will be included in the Revised Draft EIR.

5th bullet: As indicated in the Draft EIR, it is an assumption of the EIA process that Generation III technology will be used. It has been made clear in the EIR and in public meetings that if any characteristic of the power station falls outside the envelope of criteria for a Generation III power station defined in Appendix C of the Draft EIR, a revision of the EIA process would be required. Should government or Eskom proposed to build a plant that falls outside the specified characteristics assessed in this EIA, then the EIA would become invalid.

6th bullet: The emergency planning zones are designed to prevent placement of the power station too close to large centres of population.

7th bullet; The safety case that the applicant must submit to the National Nuclear Regulator must provide evidence that the power stations can be operated safely with the proposed emergency zones. These proposed zones are based on the guidance provided by the European Utility Requirements.

8th bullet; Details regarding the routine operational emissions are provided in the Air Quality Assessment (Appendix E10 of the Draft EIR). The information on emissions provided by the manufacturers of a number of different power station designs has been reviewed by the independent air quality specialist.

9th bullet: The technology on which the proposed Nuclear-1 design will be based has been thoroughly described in the Consistent Dataset in Appendix C of the Draft EIR. The Pressurised Water Reactor (PWR) technology, of which Generation III PWR designs are based, has been in operation for decades. More than 20 years of operational data from Koeberg Nuclear Power Station was available for specialists to predict the environmental impacts of the proposed Nuclear-1 power station.

General response on emergency response from the emergency response specialist:

Any potential new site is assessed in respect of its feasibility of implementing an effective emergency plan. This assessment is done in terms of National Nuclear Regulator requirements long before (many years) commissioning takes place. Installation of emergency plan support facilities will have negligible additional environmental impact and will mainly form part of the nuclear installation infrastructure on site. Emergency planning zones required for the new generation nuclear reactors are significantly smaller when compared to the zones that currently exist for most operating nuclear power reactors in the world. The existing zones, which apply to Koeberg Nuclear Power Station, were established in the mid 1970's and are as follows:

- Precautionary Action Zone (PAZ) = 5 km
- Urgent Protective Action Planning Zone (UPZ) = 16 km
- Long Term Protective Action Planning Zone (LPZ) = 80 km
- Eskom has adopted the following Emergency Planning Zones for new sites in South Africa:
- PAZ = 0-800 m. UPZ = 800 m – 3 km , LPZ = 40 km

These zone sizes are similar to the European Union requirements. The emergency plans for modern nuclear plant with their additional safety features are therefore less sensitive to population density.

YOUR COMMENT 18

Site Control:

- The DEIR conformity with DEA letter to Arcus Gibb, 19/11/08 requires that the lay-out plan of footprint & all infrastructure included in EIR. Only the envelope has been included. This begs the question as to what information all the specialists have been working on!
- The letter also requires that long term storage of high level waste be included. The comment is that legislation is awaited. This is not good enough as at present South Africa does not have an authorised facility for the disposal of used fuel and high level radioactive wastes
- The safety of nuclear waste is phrased as if a "concern" of local communities, rather than a safety issue in its own right. This displays the bias in the report. The assessment is full of contradictions, i.e. "will exert tight control" but "does not have a facility" for spent fuel. The use of the word "disposal" is also incorrect: there can not be "disposal" of spent fuel, when it has to be protected from leaking into the environment for tens of thousands of years. On any rational basis, this would be enough to reveal a fatal flaw in the nuclear power plan, but nuclear power does not appear to operate on a rational basis. Similarly, no account or estimate of the costs of long-term spent fuel management is made in the report.

RESPONSE 18

1st bullet; The layout plan of the footprint, the enveloping data through the consistent dataset has been included in the Draft EIR contained a comprehensive set of criteria to which the proposed nuclear power station must comply. This is based on a wide envelope of criteria, taking into account examples of commercially available Generation III nuclear power stations. Any power station not complying with these criteria would fall outside the scope of what has been assessed and could, by implication, not be authorised without re-assessing its environmental impacts.

2nd and 3rd bullets: In the Nuclear-1 project, provision is made to store and transport low and intermediate level waste to the licensed waste disposal site at Vaalputs. In addition, the management of radioactive waste will be done in accordance with the Radioactive Waste Management Policy and Strategy, which mandates the National Radioactive Waste Management Agency (NRWMA) for the management of radioactive waste disposal on a national basis. The current controlled practice of storage of High Level Waste at the power station in wet and dry storage is also proposed for the Nuclear-1 project. This storage occurs under safe conditions, and the risk of release of contamination to the environment is safely controlled. Please refer to the radioactive waste management study included in the Revised Draft EIR for details of the storage practices that will be used.

The term “disposal” is similarly applied to other types (non-nuclear general and hazardous waste) and these types of waste similarly never disappear from the environment, but also have to be controlled. Thus, while you are quite correct to state that “disposal” as a term may not be correct, your comment would be equally valid for all other forms of waste, including the waste that every household generates on a daily basis. The form of disposal for particular forms of waste is designed to manage the risk specific to what waste. The disposal techniques applied to nuclear waste are designed to safely contain the risk from that waste.

YOUR COMMENT 19

Eskom Grid:

- We note the preference for the Eastern Cape and ask the specialist to investigate the savings (or reduced cost of integration) if the site at Coega were used.
- Transmission integration factors have a critical influence on the decision, as there are large technical differences between the sites with respect to the need for additional generation capacity in the Eastern and Western Cape provinces and the ease with which electricity produced at the sites can be conveyed into the transmission system. These are Eskom economic issues – they are not explained and should not be taken into account in assessing a site during the EIA process!

RESPONSE 19

1st bullet: The proposal to review the suitability of the Coega IDZ as a future site for a nuclear power station holds many potential advantages, such as being in close proximity to an area of high electricity demand (thereby cutting down on the need for long transmission lines) and the fact that it is already in an area that has been earmarked for industrial development.

However, as indicated above, Coega cannot be regarded as a reasonable and feasible alternative for the Nuclear-1 application.

2nd bullet: Environmental impact assessment is required by the National Environmental Management Act to take into account all relevant factors, including biophysical, economic and social factors.

YOUR COMMENT 20

Oceanography:

- The authors of this report are simply given as “WSP Environment & Energy” There is no reference to them in the CVs. Who completed the studies? What is their level of competence?
- The report is dated January, 2010, and was clearly prepared before approval of the revised terms of reference. This is not satisfactory!
- A number of figures and diagrams quoted in the report are not shown in either the hard copy or the cddisk/on-line version of this report. This must be corrected, but begs the question as to how sincerely or thoroughly the peer reviews were undertaken! The diagrams must be provided and those incorrectly labelled corrected!
- A requirement is that possible storm damage to the intake pipes is assessed. – This does not appear to have been covered (this also applies to the sand outlet pipe)!

- Short term disruption of sediment transport during construction is shown as a heading whereas the potential impacts upon long term sediment transport are commented on. Whatever is being referred to, this requires further research and reasons given for such a statement!
- The infrastructure required to build a nuclear power station proposes the use of sea water to cool the reactors. Whereas Koeberg uses a form of harbour as a basin for the intake water and a pipeline for the hot water outfall, the proposal for the Nuclear 1 design – which is not decided on as to the final type, manufacture, capacity or design – is to use undersea tunnels of up to 2km to both supply this cooling water and to remove and disperse the hot water from the plants. As there are no design parameters, there is a complete lack of detail in how the pipeline/tunnels for the intake and exhausts are to be constructed, how they will be secured to the sea bed, or any other such detail. The sewage outfall pipeline off Green Point is built in a similar, but far lower energy conditions, and failed soon after being built. Consequently it is impossible to come to any sort of informed conclusion as to the impacts, safety and security of the construction of these feats of engineering.
- There has never been any similar scale of undersea construction undertaken in South Africa. We must remember that this site is on one of the highest energy coastlines in the world, which face the full power of the high latitude anticyclones of southern ocean. These are amongst the most powerful storms on earth, far more powerful than tropical hurricanes. The energy from these storms makes the likelihood of securely constructing these tunnels/pipelines extremely challenging. Is this why the report fails to provide any detail on the construction of this aspect of the plants. Clarification needed!
- The costs associated with the construction of these feats of engineering will be extremely high and are extremely likely to incur high cost overruns due to technical challenges related to construction. The future maintenance of these pipelines could also prove an extensive future cost and may result in high likelihood of plant shut-downs due to damage to the tunnels.
- There are many other serious issues that are not properly dealt with in the EIA. While the risk of tsunamis has been dealt with in a limited way, the risk of tsunamis originating from Antarctica, where global warming threatens the ice cap in future and where melting of any significant amount of ice will cause geological displacement, resulting in possible seismicity, is not dealt with at all. As these sites are generally southerly oriented this is another fundamental flaw in this EIA.
- The risk of global warming is extrapolated from the UN International Panel on Climate Change (IPCC) which is, generally speaking, a conservative document. Consequently the risks and impacts related to climate change in the EIA tend to be conservatively stated and worst case scenarios, such as runaway climate change related to feedback mechanisms coming into play, are not meaningfully covered or dealt with.
- There are also serious biological risks. Thyspunt may hold threats to the local chokka squid industry and fishers are justifiably concerned by this threat, which may be measurable from a radiological perspective but which will more likely be impacted by risk related to perceptions about the quality of this product.
- There are several other serious shortcomings in the EIA related to the aspects of the marine biology of this project. These include stability of the ocean bottom around the sites, which is not dealt with sufficiently. The risk and threats from the proposed dumping of vast amounts of spoil from the land based construction of the sites at sea adjacent to these proposed sites is not adequately dealt with, again especially in light of the fact that the final design of the nuclear reactors and pipelines are not yet agreed upon.
- If one only considers the construction of any of Nuclear1 from an oceanographic perspective it is our opinion that not only are there significant risks which are not adequately addressed in the EIA specialist studies, but that the final construction of the proposed marine component of these power stations – the undersea tunnels/pipelines – will increase the cost of the project to such a degree as to make the project non-viable from an economic perspective.
- If we include the myriad of other environmental risks involved in the marine and oceanographic aspects of the construction of Nuclear1, there is clearly inadequate justification to build these power plants from a sustainability, cost, economic or social perspective. These projects should be shelved forthwith in favour of the no-go option, which is the only real alternative to the proposed construction of these plants.

- It is noted that Prof. Branch, who was responsible for the deficient Marine Ecology Report, also acted as peer reviewer for the Oceanography Report (Marine Ecology report. P. 53). We do not think that this is acceptable!
- There are many items that have been glossed over, ignored, or merely briefly covered. The report needs to be totally redone covering all aspects!

RESPONSE 19

1st bullet (CV): The CV of the author of this report, Rhys Giljam, was included in Appendix E1 of the Draft EIR.

2nd bullet (Report completion prior to approval of Plan of Study for EIA): Please refer to our response above regarding the commencement of the specialist studies before the approval of the Revised Plan of Study for EIA.

3rd bullet (Diagrammes and figures): The EIA team acknowledged its error and subsequently provided the figures online and in hardcopy. The comment period for the Draft EIR as consequently extended.

4th bullet (Storm damage) The preferred design option for the cooling water intake consists of an undersea intake connected to the shore via an undersea tunnel. The intake structure is to be placed at the end of the intake tunnel at a depth of about 25-30m below mean sea level. This will result in an overall tunnel length from the onshore access shaft of approximately 1.0km to 2.0km. The outfall will be constructed from 3 to 4 pipes 3m in diameter placed beneath the sea floor. The ends of the pipes will be raised to prevent erosion of the sea floor.

5th bullet (Disruption of sediment transport): In the short term the possible construction of the cofferdams at the Thyspunt site will influence sediment transport along the coast over the construction phase of the development. Although the sediment transport varies along the beach due to the presence of rip cells, the net transport along the beach is low. The cofferdams are therefore expected to have a limited effect on the sediment transport and coastal erosion. Once construction has been completed the cofferdams will be removed. The overall significance of the impact is therefore considered to be low. Over the long-term (operational phase of the project) the inlet pipes will be placed beneath the sea floor and will therefore not impact sediment transport along the coast, whilst the discharge point of the outlet pipes may form a minor barrier to sediment movement.

6th bullet (Details of pipelines): A description of the intake and outfall pipelines is provided in section 4.3.5 of the Oceanographic Report. The cooling water intake and outfall structures will be designed to 'no damage' criteria (less than 5% damage) using appropriate extreme conditions and conventional coastal engineering procedures and will be positioned in a depth (-25 to -35m amsl) where extreme wave conditions do not have a damaging impact (which might jeopardize the intake of cooling water) on the structure or any of its components. Detailed engineering design will be undertaken prior to the construction of the NPS.

7th bullet (Costs): Assessing the feasibility of the engineering design goes beyond the scope of this report. It is however considered that the merits of the engineering design options will be considered by Eskom and the coastal engineers when undertaking detailed design for the project.

8th bullet (Tsunamis); There are several recognised sources for tsunami generation in the ocean, which include submarine earthquakes that displace segments of the earth's crust, submarine volcanic explosions, submarine landslides, nuclear and large-scale chemical or munitions explosions in water, cosmic body strikes in the ocean, and decomposition of gas hydrate where crystallized methane and water in ocean sediment may be released when destabilized. Sumatra, Karachi and the South Sandwich Islands were identified as tsunamigenic regions that can affect the coastal areas of South Africa in a Council for Geoscience report titled 'A Probabilistic Tsunami Hazard Assessment for Coastal South Africa from Distant Tsunamogenic Areas'. For each region the report provides the maximum credible earthquake magnitude and the corresponding fault parameters. These data were subsequently used by the coastal engineers in the site safety reports. A search of the available

scientific literature could not find conclusive evidence that there is a risk of tsunamis originating from Antarctica, should melting of the ice cap cause geological displacement.

9th bullet (Global Warming): The adopted parameters for long term climate change are based on the information available at present from a respected international resource (IPCC). It does however need to be continually reassessed as new data and research results become available.

10th bullet (Risk to chokka): The risk to the chokka industry are dealt with in the Marine Biology Assessment (Appendix E15 of the Draft EIR) and the Economic Assesment (Appendix E17 of the Draft EIR). Ongoing monitoring at Koeberg Nuclear Power Station since before the commencement of construction has concluded that the impacts of the power station on marine life is negligible. Fishing products caught along the Cape west coast in the vicinity of Koeberg Nuclear Power Station do not suffer from negative perceptions, neither does fresh produce produced on land. Even for organically certified products, there are no criteria that would prevent such products from being certified due to their origin in proximity to a nuclear power station.

11th bullet (ocean floor): The impacts of the disposal of spoil are not dependent on the design of the nuclear reactors, but on the volumes, pumping rate and depth of release of the spoil. These factors have been adequately assessed in the Oceanographic Assessment (Appendix E16 of the Draft EIR).

12th bullet (Cost of tunnels): We take note of your comment.

13th bullet: We take note of your opinion.

14th bullet (Prof. Branch's involvement): Prof. Branch was not responsible for the marine assessment. The marine assessment was prepared by Dr Tammy Robinson and Prof. Charles Griffiths of the University of Cape Town. Prof. Branch acted as peer reviewer of the Marine Ecology report and has not reviewed the Oceanographic Assessment. The peer reviewer of the Oceanographic Assessment (as indicated on page 7-26 of the Draft EIR) is Eddie Bosman of the University of Stellenbosch.

15th bullet (report to be redone): We take note of your comments but stand by the content and outcomes of all the specialist studies undertaken for this EIA.

YOUR COMMENT 21

Coastal Engineering:

- It is noted that the authors indicate that they still need additional information. We look forward to receiving their revised report, but in the circumstances consider that no final conclusions can be drawn!

RESPONSE 21

Your comment is noted.

YOUR COMMENT 22

Economic:

- Great emphasis has been placed by Eskom on the job-creation possibilities for the local community. This should not be exaggerated and must be offset by the probable loss of 4000 jobs in the chokka industry.
- A major omission relates to the potential damage to the chokka industry. It has an immediate bearing on the Economic Report. The combined impacts of R6 million cu.m of spoil on the ocean bed, together with market perceptions that squid captured in this area could be contaminated, destroy the squid industry, this would lead to the loss of 4000 jobs and R500 million per annum to the area. This would also result the indirect loss of other jobs. Both these factors must be considered must be factored in!

- The DEIR conformity with DEA letter to Arcus Gibb, 19/11/08 requires that cost comparisons to other forms of technology are covered. Where do these appear?
- This is meant to be an independent survey- why is it that so many costings are obtained from Eskom – this is not satisfactory and independent comparisons must be obtained.
- The main reason for choosing Thyspunt as the site for Nuclear1 seems to be an economic one, the economics of Eskom. What about the wider SA community?
- We have previously pointed out that the cumulative impact of a power station and its associated transmission lines should be assessed before final conclusions can be drawn.
- The report ignores the assurance given by Eskom at public meetings where they stated that they will be responsible for the up-grade of the N2 from Port Elizabeth to Humansdorp, to cater for both extremely heavy and heavy load traffic. The cost of this must be included!
- In a similar way the report is silent on the cost of upgrade of the R330, and construction of the eastern access road.
- A full engineering assessment of the proposed eastern route is required before any conclusions on viability or costs can be drawn. This must be cross referenced to the Dune Morphology Assessment as well as other specialists.
- A costing anomaly appears in respect of the transmission lines. According to the Draft EIA report, the lines from Thyspunt to Port Elizabeth would cost R10m per kilometre, whereas those from Duynfontein would cost R26.8m. How can this be? This will obviously affect the comparative costing.
- A major omission from the economic calculation is the cost of the proposed pipelines for the disbursement of the sand spoil as well as inlet and outlet of cooling water at Thyspunt. It is clear that no proper feasibility study has been done on this. What can be stated with confidence is that such a pipeline would be situated on one of the most storm-prevalent pieces of coastline in the world, and would have to be built to very high levels of specification. The engineering involved would be challenging in the extreme. The cost must be calculated and brought into the equation.
- A further issue is insurance in case of disaster. Normal insurance in SA excludes nuclear disasters. What happens in case (although unlikely) of evacuation and nuclear contamination? The specialist states "...it is clear that all three sites would have a very positive impact on unskilled job creation" What about job losses?
- The future costs of post-operational life, of guarding the power station and of decommissioning and of long-term spent fuel management are effectively ignored. Certainly, decommissioning is a burden on future generations since, although it appears to add to GDP figures, there is no addition to wealth, and a diversion of human resources to unproductive work. This needs to be investigated.
- The property of individuals is not covered by insurance. So far neither Eskom nor Government have accepted the risk! What is the cost of Eskom accepting this liability! It was reported that Eskom only has limited public liability cover.
- No mention is made of the fish processing factory at Port St Francis and the economic effect on the operation of the port itself.
- At the time that the economic impact assessment was prepared, the results of the seismic risk assessment were not yet available. Therefore, potential costs associated with the design and construction of a structure that would be able to withstand seismic risks has not been included in the economic impact assessment. This is pertinent, but how can it be produced when even the technology is not yet known?
- The cost of additional items such as off shore pipelines, transmission line and internal roads bridging sensitive areas has been ignored or glossed over. These factors need including, both in the economic report as well as by the relevant specialists.
- It is obvious that the entire Economic Assessment needs to be re-done, based on a comprehensive knowledge of all relevant economic factors.

RESPONSE 22

1st bullet (job losses): Comment from the economic specialists: The comment about the job creation is not exaggerated and is according to our calculations feasible. After again working through the Marine Report we are convinced that the impact on the chokka industry will be very limited.

2nd bullet (damage to the chokka industry): Comment from the economic specialists: We cannot understand the comment about a “major omission” when the chokka industry was covered in detail. Interviews were held with the largest chokka company in the area as well as with Marine and Coastal Management, and discussions were held with the Marine Ecology specialists. Some minor edits have been made to the text in the report for the Revised Draft EIA. We reiterate the finding the impact will be very limited. The comment about the impact of the settlement of the spoils on the sea bed on the chokka industry is to our mind not backed by a scientific report and we accept the findings of the Marine Biology Assessment (Appendix E15 of the Draft EIR).

3rd bullet (Cost comparison to other technologies): Comment from the economic specialists: Our Terms of Reference was to evaluate the three sites in terms of economic impacts, identify any fatal flaws and identify economic benefits. We were not asked to compare different technologies; however the following comparison is available and presented. The following is quoted from: Source: Electricity Power Research Institute – May 2010: Power Generation Technology Data for Integrated Resource Plan of South Africa.

In the next table the construction cost and operational cost of a coal fired power station and a nuclear power station are compared.

	Construction Costs	Operational Cost	
	Rand/kW	O& M R/MWh	Fuel Cost, R/MWh
Coal Fired			
Plant Cost Estimates with FGD (January 2010)	R 17 785	R 105.50	R 146.50
Plant Cost Estimates without FGD (January 2010)	R 15 470	R 83.00	R 144.60
Nuclear			
Nuclear Areva EPR Technology	R 26 576	R 95.20	R 67.30
Nuclear AP1000 Technology	R 31 245	R 118.10	R 64.10

FGD refers to “Flue Gas Desulphurisation” which is a process fixed to the coal power stations to reduce sulphur released into the air. This is a prerequisite for the World Bank loans. The two nuclear options are the French and American technologies. The table shows that, as far as construction costs are concerned, the coal-fired power stations are the cheaper option. However, in respect of fuel costs nuclear is less than 50% of coal. The above costs are only the direct costs and do not reflect the environmental costs associated with coal mining and coal-fired power stations.

In the next table the cost of nuclear and two renewable energy options are compared.

	Construction Costs	Operational Cost	
	R/kW	Fixed O& M R/MWh	Fuel Cost R/MWh
Wind			
200 MW Capacity	R 14 445	R 74.90	R 0.00
Solar			
125 MW (9 hour storage)	R 50 910	R 167.90	R 0.00
Nuclear			
Areva EPR Technology 4800 MW Capacity	R 26 576	R 95.20	R 67.30

Source: Electricity Power Research Institute – May 2010: Power Generation Technology Data for Integrated Resource Plan of South Africa

The table indicates that wind is the cheaper option, but note should be taken of the maximum capacities at present available, with the two renewable options delivering very small quantities if compared with nuclear. Another factor to be taken into consideration is the projected economic lifetime of the different options, nuclear being 60, wind 20 and solar 30 years. Reading the above together with the government White Paper in the UK (2008) which stated that all evidence pointed to the costs of nuclear power being lower than that of coal and gas, the evidence seems clear that nuclear is the cheaper and more appropriate option for the three sites to produce enough power for a growing South African economy.

4th bullet (source of costs): Response from the economic specialists: The statement that Eskom acts as provider of costs is only true as far as direct costs associated with the construction of the nuclear power station as they had already received cost indications from the two potential providers. Eskom in some cases provided quantities, which were then costed by the consultants and in others provided costs which were checked by the consultants. We are convinced that enough was done to verify Eskom figures and confident that the report is independent.

5th bullet (Rationale for choosing Thyspunt is economic): Response from the economic specialists: The comment about the wider community is not clear, as modern growing economy needs electricity, which eventually benefits the total South African community.

6th bullet (Assessment of cumulative impacts): As indicated during public meetings for Nuclear-1 and in the Draft EIR, it is not feasible to assess the impacts of all three proposed power station sites and the transmission line corridors in a single assessment. Furthermore, the separation between the power station and transmission line EIAs has been accepted by the Department of Environmental Affairs. It will be incumbent of the Environmental Assessment Practitioners that finalise their reports last to consider the findings of the preceding reports so as to assess the cumulative impacts.

7th bullet (Costs of roads upgrading):

Response from the economic specialists: We as economic consultants are dependent on the results of the Transport Assessment. Roads identified in the report are the ones included in the evaluation models.

Response from the Environmental Assessment Practitioner: A preliminary assessment of the N2 has confirmed that it is capable of handling the types of loads being considered for Nuclear-1. However, upgrading of intersections and interchanges may be necessary to allow for the large turning circles of the extra-heavy loads.

8th bullet (Costs of upgrading the R330): Preliminary engineering studies have confirmed that the R330 will be able to handle the loads being considered for Nuclear-1. However, additional and more detailed studies need to be conducted prior to a detailed for cost for upgrading can be determined.

9th bullet (Costs and feasibility of the Eastern Access Route): The Dune Geomorphologist has completed an addendum to his report to investigate the risk of debris flows at the Thyspunt site and found no evidence of this being a risk to roads at the site. The Eastern access route is therefore regarded as feasible. Detailed engineering designs will be undertaken during the design phase of the road to ensure that the road foundations are adequate. However, there is no risk associated with the underlying soils and geology to warrant a full engineering to confirm the viability of this route.

10th bullet (Costs of transmission lines): Response by the economic specialist: The cost of the transmission lines reflects the full cost of the integration in the National Grid - this includes sub-stations and line costs.

11th bullet (Inclusion of costs of spoil pipelines): Response by the economic specialist: The statement that a major omission in the economic calculation is the cost of the pipelines discharging the sand and spoils in the ocean is not true. The specific inlet and outlet construction was part of the original design for the Nuclear Power Station.

12th bullet (Insurance):

- Response by the economic specialist: Insurance was not considered as we were of the opinion that it is the same for the three sites. The impacts on possible job losses has been quantified.
- Response by the Environmental Assessment Practitioner: Section 29 of the National Nuclear Regulator Act requires Eskom to make financial provision for insurance purposes. Regulations issued by the Minister of Energy stipulate how much financial provision must be made (Government Notice 581 of 2004). The current figure stipulated is R2.4 billion. Eskom makes the financial provision through insurance (that is obtained from the international nuclear insurance pools and which is in dollar denomination resulting in a financial provision in excess of R3 billion. Every year Eskom has to provide proof that the financial provision (insurance) has been obtained.

13th bullet (Future costs): Response by the economic specialist:

The statement about decommissioning and post operational life necessitates a full answer. The following is quoted from the final Economic Report: *"The issue around decommissioning and economic impact of the action will be driven and influenced by a number of factors including the following:*

If the NPS operates for its full anticipated lifetime of 60 years, it will be a closing down exercise with very little difference between the sites except for the cost of removing the nuclear waste where the actual disposal site is located further from the one proposed site than the other. In international practice, it is customary to use a figure of 15% in estimating the cost of decommissioning a nuclear power plant. If this is applied to the constant estimated reactor cost, a figure of between R17.5 and R20.0 billion in 2009 prices is projected as the cost.

Further scientific development over the lifetime of the plant can also mean that the plant can be revitalised and the lifetime extended. The present mothballed coal-fired power stations of Eskom are an example, where updating them has added fifteen plus years to their productive lives. Again, very little difference between the three sites will exist.

The third issue to be considered is that if the envisaged Eskom nuclear programme materialises, more than one unit will by then be constructed at each site, with the expertise and know-how available to proceed with the decommissioning if still necessary."

14th bullet (Insurance): Please refer to the response to Bullet 12 above.

15th bullet (Fish processing factory): cAn interview was held with the largest fish processing company in the area, and the issue is dealt with in the report, contrary to the contention.

16th bullet (Seismic report not available when economic assessment was completed): Response by the economic specialist: It is true that at the time of the draft economic report the seismic risk assessment report was not yet available. The Seismic Risk Assessment Report is now available and we were assured that the present design will be within safety parameters.

17th bullet (Costs glossed over): Response by the economic specialist: The comment that the Economic Report glossed over additional items is not true. We used firstly a detailed Cost Effectiveness Assessment Model (CEA) for each of the three sites, which is constructed for a very large number of detailed items. This model in affect gave us the so-called Least-cost Option to the society at large. Secondly we used a separate model to calculate the Macro-Economic Impacts of the construction of the NPS. This macro-economic model is an econometric model based on the provincial Social Accounting Matrix (SAM) of each of the two provinces involved. In reaching the final economic conclusion, current local economic activities and the possible impact of the construction of a NPS, together with the projected benefits to the country and population at large, were weighed and a decision was made.

18th bullet (Economic assessment to be redone): Response by the economic specialist: A lot of effort went into the study to be as objective as possible in reaching a decision about the three sites. We are convinced that the decision reached is within the parameters set by the Terms of Reference and that another study would not reach a different conclusion.

YOUR COMMENT 23

Social:

- The report is dated January, 2010. Approval of the final Plan of Study and Terms of Reference for specialists was only published on 19 January, 2010. How was it possible to produce such a report at such short notice, so soon after publication of the final terms of reference? It seems that this is a breach of the final terms of reference requirements and that the report needs to be redone in its entirety!
- The potential social impact of huge volumes of traffic, uncontrolled influx of unemployed job-seekers and accompanying illegal informal settlements, probable industrialisation of the area and total change of sense of place cannot, either jointly or severally be described in terms of medium impact, except in terms of bureaucratic language which bears no relation to the reality on the ground.
- This flawed assessment fails to assess the capacity of the Kouga Municipality to provide the basic services that the development will require, as well as its capacity to regulate or mitigate negative social impacts (e.g. squatting). We need an assessment of the municipality's capabilities in this regard.
- Would the specialist agree that in its present state, the area incorporated by the Greater St Francis/Oyster Bay region is coastal land of an exceptionally high environmental quality, which warrants high conservation status? Would he agree that placing a NPS at Thyspunt would irrevocably and permanently alter the character of this area, with huge environmental and social impact? Why, then, does he not say so as clearly and as strongly as possible in his report?
- The revised terms of reference require accurate holiday population figures for the Greater St Francis area. Only an estimate is provided, which is clearly a thumb suck and is totally incorrect. It is stated that the figures given must be investigated in more detail for future reference. When will this be done? The report is obviously flawed if based on incorrect data!
- The demographic information is outdated. This has been queried previously and the report requires redoing based on correct data!
- Maps used are completely outdated and were requested to be withdrawn years ago!
- Measurements used (eg the distance of Sea Vista School from the site) are totally incorrect and all of these references need checking and correcting when necessary!
- The report ranks the impact of the influx of unskilled and unemployed job seekers without mitigation as "medium", with a "high level of probability." Mitigation measures proposed are an information campaign; engagement between the contractor and local authority to prevent squatting near the construction village or site; transparent public participation process with I&APs; use of local labour as far as possible; monitoring of situation. This is potentially a major problem! What would be an acceptable level of influx to the St Francis area? Did the specialist consider the impact on infra-structure, such as water and sanitation, in arriving at his conclusions? Does the specialist seriously consider that the proposed mitigation measures would have any significant impact on the problem? Why are these scenarios not discussed in the report?
- The report comments on the increase in illegal informal dwellings. How does the specialist arrive at any conclusion on this when the numbers are completely speculative? What legislation exists which can be enforced by the local authority in the manner suggested? Has a commitment been received from the local authority that this will be enforced?
- The traffic impact assessment is another example of the shoddy manner in which Eskom is approaching this EIA. Even at this late stage, we have no idea where the Construction and Staff Villages are to be placed. The speculation is in Humansdorp. There are contradictory messages regarding the route that commuter traffic would take morning and evening. Some reports suggest that this will follow the R330, while others suggest that the Oyster Bay road may be used. This has a massive bearing on the impact of the whole project on adjacent communities. The Traffic Impact is discussed purely in terms of road up-grades and transport requirements for staff. There is no discussion at all on the impact on the life style of the existing established community.
- Is traffic noise adjacent to an established community not a noise consideration? If it is, how will this be addressed?

- Does the specialist agree with the Noise impact report which addresses only the construction site and concludes that there would be no noise impact on land surrounding the property during site construction and operation of a NPS, and that no noise mitigation procedures would be required? If not, why does he not say so in his report?
- Would the specialist consider the impact to be “low” if he had bought into the Homestead Retirement Village, which is adjacent to the steep hill between St Francis Bay & Sea Vista Township, or a residence on the banks of the Kromme River adjacent to the bridge? We do not believe that factors such as these have even been considered.
- Provision is made for an assessment of cumulative social impacts including other past, present and future activities, on a common resource. One would have thought that this would cover the combined impacts on St Francis Bay of the enormous volume of traffic; the accompanying noise factor; the uncontrolled influx of unskilled job-seekers; accompanying expansion of informal settlements, with its attendant social problems; the lack of educational facilities etc, the likely industrialisation of the area to serve the NPS; and the consequent complete change of sense of place. No attempt is made at any such cumulative impact assessment. We expect this to be done!
- Failure to assess the cumulative impact in any meaningful way should be regarded as a fatal flaw in the Social Impact Assessment!
- The impact on sense of place is the most abstract of the issues being raised, but this encapsulates the overall change which will take place to the area in the event of a NPS at Thyspunt. It should involve an assessment of the current sense of place, and of the changes which will occur. It is, in effect, an extension of the summary of the cumulative impacts which are so inadequately dealt with in the Report, but should include all other relevant impacts, including environmental. The Social Assessment treats us to a theoretical discussion on the subjectivity of “sense of place”, quoting Wikipedia. It is virtually dismissed as “perception”, and everything is presented as hypothetical. The report continues “The sense of place may be affected by real or perceived impacts from the new development, changes in the character of the area due to increased urbanisation, increased settlement densities, noise levels and traffic, and the change to visual character of the surrounds. This concern relates to the possibility that the NPS may contribute negatively to the current characteristics, or feeling / perception held by people. Communities experience that their place have a special and unique character.” The reality is that this area has a combination of qualities which ought to be regarded as a scarce resource in South Africa, and which the country should be preserving as national heritage. Instead, we are contemplating turning it into a massive industrial development, with immeasurable and unmitigable environmental and social consequences. The specialist appears to regard this as a purely theoretical matter without providing any facts.
- It would be difficult to conceive of a more complacent and inadequate response to a very serious impact. This encapsulates all the inadequacies of this report from start to finish.
- From the perspective of the local community, this is one of the major issues raised by the current proposal. It cannot be simply swept under the carpet. We request that another more competent and more practical specialist should be appointed to review and revise the report in the light of issues raised.

RESPONSE 23

1st bullet (Assesment completed bedfore approval of the Revised Plan of Study for Scoping): Please refer to our response above on this issue.

2nd bullet (Traffic, job seekers, informal settlements, etc): The Environmental Assessment Practitioners stand by this assessment.

3rd bullet (Kouga Municipality capacity): Response from the Social Assessment Specialist: The Social Impact Assessment recognises the shortcomings in the capacity of existing services and facilities to address the growth in the population without mitigation measures. Providing these services will definitely have cost implications for the various role-players involved as indicated in the report. The Draft EIR has recommended that Eskom must reach agreement with the municipality on the apportionment of costs for the upgrading of services prior to the commencement of construction.

4th bullet (Conservation status of St. Francis area): Response from the Social Assessment Specialist: Sense of place will always be a subjective assessment based on realities and perceptions. The possible changes that the proposed NPS will bring are clear and different individuals and communities will experience the change in sense of place differently.

5th bullet (Holiday population figures): Response from the Social Assessment Specialist: Holiday population figures derived from the Tourism study indicate around 8 000 during Easter and 30 000 during Christmas and New Year. This increase in numbers is only for a short duration. The social report relies on generally accepted sources of population data. From these sources projection and assumption can be made. The social report clearly analyses the impact of growth in population numbers on various social impacts, one of them illegal informal dwellings. The focus is not on the exact numbers but on the process to manage any illegal dwelling.

6th bullet (Accuracy of demographic data): Although Statistics SA provides certain statistical updates on a regular basis, gaps do exist in the official data obtainable from this institution. Although this lack of more recent area-specific data has been a limiting factor, these limitations have not been insurmountable as a fair, if not relatively accurate, estimate, can be obtained by plotting the available data against updated Provincial and National trends;

7th bullet (Outdated maps): Revised maps will be included in the amendment of the Social Impact Assessment to be included in the Revised Draft EIR.

8th bullet (Measurements incorrect): Measurements will be checked for the amendment of the Social Impact Assessment to be included in the Revised Draft EIR.

9th bullet (Influx of unskilled labour): The Social Impact Assessment (Appendix E 18 of the Draft EIR) assessed the impact of the influx of job seekers on the areas surrounding Thyspunt.

The Social Impact Assessment reports that Provision for future residential development has been made in the Kouga Spatial Development Plan (2009), in and around Sea Vista, Cape St Francis, Oyster Bay and Humansdorp. Unsuccessful job seekers from outside the area could explore possibilities in neighbouring towns such as Humansdorp and Jeffrey's Bay. This will contribute to the already high unemployment levels in the area, with negative impacts on the general fabric of community. Accommodation opportunities near the proposed Nuclear Power Station are limited. Expansion of the existing informal settlements is not a feasible or desirable option. New housing schemes planned for the area focus on existing people already living in the area in informal settlements or backyard shacks. The following mitigation measures is however proposed:

- A proactive, broad-based information campaign (including site notices) to clarify the number of job opportunities that will be available. The objective is to dispel rumours and unrealistic expectations and thereby seek to curtail the inflow/settlement of job seekers
- Proactive engagement by the appointed contractor(s) with local authorities/ SAPS/ CPFs to ensure that job seekers do not settle in the vicinity of Staff Villages or the construction site.
- Follow a transparent public participation process with role-players and interested and affected parties;
- Make use of local labour and local suppliers of material for the construction as far as possible;
- Monitor the situation after the occupation of the Construction Village, Staff Village and housing projects, and involve the relevant role-players in such process.

The concern raised regarding local infrastructure is very relevant. Eskom will be required to engage with the local authorities prior to construction to determine and document responsibilities for this.

The Social Impact Assessment further assessed the impact of the influx of job seekers in the areas surrounding Thyspunt and mitigation measures are aimed at minimising the number of job seekers staying in the area. Mitigation measures are described in section 3.2 of the report.

10th bullet (Increase in informal dwellings): Municipalities are mandated and legally required to enforce municipal bylaws related to informal dwellings, regardless of whether a Nuclear Power Station is

planned within their jurisdiction. The number of the informal dwellings can not be accurately predicted as this is subject to a number of variables such as how well the municipality enforces said bylaws.

11th bullet (Traffic Impact Assessment): it is not the purpose of the traffic impact assessment to assess the impacts of the lifestyles of the existing community. The assessment of these impacts is a function of other assessments such as the Social Impact Assessment and the Noise Impact Assessment.

12th bullet (Consideration of noise): Please refer to the noise impact assessment (Appendix E23 of the Draft EIR) for an assessment of noise impacts.

13th bullet (Social specialist agreement with noise specialist): Mitigation of noise impacts is not the in the brief of the social specialist, and neither should it be, as each specialist is required to assess the environmental impacts from their particular field of expertise.

14th bullet (Homestead Retirement Village): The social impact specialist and all other specialists are required to maintain an objective and non-partisan approach and cannot be required to comment on their perception of impacts as if they had local interests.

15th bullet (Cumulative impacts): Cumulative impacts are addressed in the Draft EIR.

16th bullet (Failure to address cumulative impacts): We take note of your opinion in this regard.

17th bullet (Sense of place): The specialist has correctly indicated that the sense of place is a matter of perception. There is no objectively definable sense of place, and what one person may perceive as a pristine sense of place may be perceived differently by another person, depending on the person's particular background and education.

18th bullet; We take note of your opinion in this regard.

19th bullet (Revision of report): The report was prepared by Dr Alewijn Dippenaar, with review and guidance from Dr Neville Bews, a well respected Social Impact Assessment practitioner in South Africa.

YOUR COMMENT 24

Visual:

- We repeat that the impact on sense of place is the most abstract of the issues being raised, but this encapsulates the overall change which will take place to the area in the event of a NPS at Thyspunt. It should involve an assessment of the current sense of place, and of the changes which will occur. It is, in effect, an extension of the summary of the cumulative impacts which are so inadequately dealt with in the Report, but should include all other relevant impacts, including environmental. The reality is that this area has a combination of qualities which ought to be regarded as a scarce resource in South Africa, and which the country should be preserving as national heritage. Instead, we are contemplating turning it into a massive industrial development, with immeasurable and unmitigable environmental and social consequences. The specialist fails to deal with this from a visual point of view.
- The specialist seems to have additional information regarding inter alia placement of roads and transmission lines "*Roads for Thyspunt will have the most negative impact on the sense of place, with the northern route identified as having the least negative impact as a result of it being visually integrated with the highly visible transmission lines*". We totally agree with this approach, but all the information must be available to the public!

RESPONSE 24

1st bullet (Cumulative impacts): The Visual Impact Assessment (VIA) conducted as part of the EIA is attached as Appendix E20 to the Draft EIR. The impact of the construction of the transmission lines on the visual character of the area does however not fall within the scope of the Environmental Impact Assessment for the Nuclear Power Station per se. The VIA reports that the visibility the Nuclear

Power Station at Thyspunt is contained along the coast by east-west orientated dune fields. This limits the visual exposure of the Thyspunt Nuclear Power Station to the towns of Oyster Bay and Cape St. Francis. The example of the existing Koeberg Nuclear Power Station is instructive in this regard. Despite it being situated within sight distance of two World Heritage Sites (Table Mountain and Robben Island) and the internationally important tourism regions around Cape Town, the exemplary conservation management of the Koeberg Nature reserve has added value to the area and is well recognised as an important biodiversity and recreational resource. Arguably, and in the opinion of the biophysical specialists, the creation of a nature conservation area around the power station could add value to the area, as was the case at Koeberg Nuclear Power Station.

2nd bullet (Access Roads): The Visual Impact Assessment specialist had access to the same information as the other specialists. This information is contained in full in the various specialist reports and in the Draft and Revised Draft EIR. In view of the fact that the visual specialist was the only specialists who preferred the northern access road (as indicated in the Draft EIR), the northern access road was regarded as least preferred. Its impacts on the Oyster Bay Mobile Dune System (acknowledged in your own submission to be one of the unique features of the area) was found to be unacceptably high and it has therefore been recommended in the EIR that this alternative access road should no longer be considered.

YOUR COMMENT 25

Heritage:

- The Heritage factor must be a totally separate report any the Archaeological report with specialist input from both areas (sic). Both of these aspects need fully covering (sic) and will be material.
- Heritage is a major political factor both in South Africa and internationally and can't be ignored or swept aside as may have been the case in Eskom's investigations some thirty years ago.
- Very little research has been done on the presence of the Gamtobakwa people in this area.
- There is an obligation to act in terms of the UN's declaration of indigenous peoples rights (of which the South – African Government is a co-signatory), the UNESCO or ICOMOS Burra Charter guidelines, and the Kari-Ocha and Kimberley declarations. These declarations and guidelines all require "informed consent" before any development can take place on indigenous peoples land. Has the specialist investigated this?
- Further information must be supplied on what causes ended the long "occupation" of the area by Khoikhoi.
- The consultants indicated that even mitigation is destructive, and since Thyspunt is regarded as the most sensitive of the sites it should have been scoped out of the process on its cultural heritage value alone.
- The living heritage associated with the KhoiSan people with specific reference to medicinal and other useful plants that occur within the study area be investigated further.
- New archaeological discoveries have been made in this area in recent years. The fact that they are not mentioned means that further research is necessary.
- The report completely ignores the existence and value of an incredible archaeological record comprising evidence of human occupation from Early Stone Age to the post-industrial age (few places in the world can boast this).
- It would appear that the specialist had access to copies of all previous archaeological assessments. None of this has been made available as part of this report. Why not?
- No mention is made of shipwrecks, whether historical or not. These must be fully investigated in view of the construction of pipelines. This will require a separate specialist investigation.
- Obviously the work is incomplete and requires a great amount of further attention!

RESPONSE 25

1st bullet (Heritage report separate): Your comment is not understood. Heritage is regarded to consist of a combination of archaeological, palaeontological and other elements and all these elements need to be assessed holistically in a single report. It is a requirement of the South African heritage Resource Agency that all these elements need to be considered in a Heritage Impact Assessment.

2nd bullet: (Heritage can't be swept aside): We agree with this comment.

3rd and 4th bullets (Research into Gamtobakwa people and "Ancestral land"): Response from the Heritage Impact Assessment specialist. The background to the presence of the Khoikhoi people in South Africa is described on a number of occasions throughout the report. Since the section on Thyspunt was the final site evaluated, the topic had been sufficiently covered and did not need to be repeated. It is important to note that no particular groups of people were identified during the course of the study as the archaeology of the study area is of overall massive antiquity and therefore national heritage, and in some aspects international heritage. Furthermore the limited amount of detailed study that has taken place to date does not provide secure enough evidence to equate the archaeological material to any particular grouping of people, other than to state that the presence of ceramics on some sites indicated that they developed during the last 2000 years, which coincides with the broad time period that the Khoikhoi were present in the area. Archaeological sites characteristic of this period are to be found throughout much of the Eastern Cape, Northern Cape and Western Cape. Hence in broad terms all three of these provinces are ancestral land. Defining the boundaries of ancestral land for the various groups is a highly complex task that needs acknowledgment of the detailed dynamics of the movement of groups over space and time. This history, apart from small glimpses of it in historic records, has mostly been lost.

The Draft Environmental Impact Report (Draft EIR) and the associated Heritage Impact Assessment report additionally acknowledge that the heritage of the area is the "heritage of many South Africans who are alive today". The heritage section of the Draft EIR report is of a general nature and tries to be impartial in the view of the fact that the heritage of the study area is part of "the National Estate". The study has truthfully informed the public of the presence of a wide variety of archaeological sites but cannot ascribe those sites to particular groups of people apart from in the broadest of terms. It now remains for I&AP's to register their interest, and exercise their rights in terms of the laws of the land.

5th bullet (Ending of "occupation" of the area by the Khoikhoi): The Khoikhoi, here as in most other parts of South Africa, were affected by the immigration of white colonists.

6th bullet (Thyspunt to be scoped out): Your opinion in this regard is noted. In terms of mitigation, the heritage specialist has indicated to the applicant that the work required is potentially very demanding on both hard-pressed archaeological expertise resources and existing state capacity. At Thyspunt the final site location has a critical bearing on how much archaeology will be affected. The recommended footprint of the power station has been positioned so as to avoid the dense concentration of heritage sites within 200m on the the coastline. The heritage specialist agrees with the notion expressed that archaeological sites are best preserved on-site for future generations and conservation-minded archaeologists will always strive to achieve this goal. Mitigation by excavation is always a second best and should be avoided, where possible. However, the environment has been assessed holistically and in some instances, other factors may weigh more heavily than heritage factors.

7th bullet (Living heritage): Your opinion in this regard is noted.

8th bullet (new archaeological discoveries in the area): The Heritage Impact Assessment is required to investigate the heritage resources specific to the site. There is plentiful reference in the report to other research that is relevant to the Eastern Cape and to the specific site.

9th bullet (Report ignores archaeological record): The Heritage Impact Assessment extensively discusses the history of the area, from the Stone Age to recent times.

10th bullet (Shipwrecks): According to the National Shipwreck Register (SAHRA) three ships were wrecked in Thysbaai during the 19th century. These are likely to have been driven up onto the rocks or beach.

Since the site is coastal and will involve engineering work off-shore, there is a remote possibility that impacts to protected shipwrecks may occur. The impact would depend on the form of engineering

taking place. This issue will need to be addressed by means of specific heritage impact assessments once there is further clarity as what technology is selected and how cooling water will be obtained and returned to the ocean. However, the nature of the impact (namely inundation with sand) may not necessarily harm any maritime material, other than to bury it.

11th bullet (Work incomplete): We disagree with your opinion and regard the Heritage Impact Assessment to be a complete and thorough account of the heritage of the area.

YOUR COMMENT 26

Agricultural

- The EIA states that agricultural land values around these sites would decrease in value due to farmers' concerns regarding contamination of produce or animals.
- If any farmers were producing organically certified or "organic" produce or meat, they would also have to consider customer concerns and a potential loss of buyers. Organic certification guidelines would have to be investigated as such farmers could lose their certification.
- According to the specialist a nuclear power station development would benefit the farmers during the construction phase as the labour force employed on site would increase the market for agricultural products. The problem is can agriculture production be increased in this zone surrounding Thyspunt? Local consultants dispute this and feel that only limited production can occur in the zone because
 - Area is already overstocked;
 - Lack of available water for increased irrigation;
 - Variable markets for agricultural production;
 - Uneconomic value of agricultural ground;
 - Competition from other agricultural areas; and
 - Excess crops and dairy products are traded on the world market.
- The report does not justify the statements that farmers would have a temporary economic benefit if the power station is constructed at Thyspunt and the specialist needs to fully investigate this.
- Other negative impacts include the large increase in heavy-vehicle traffic, causing undesirable dusts and contributing to the spread of diseases in plant crops.
- It is not possible to understand how the specialist came to the conclusions reached in their final summary. The quantum leap taken to assign positive impacts on the various sites is not documented and requires full explanations.
- The interpretation of the assessment is hampered by the fact that the tables supplied were in most instances incomplete, as key livestock figures were missing (see Appendix 1 from which one assumes Table 2.9 has been generated as an example). How can the specialist reach a conclusion without the full data such as, the total head of livestock, hectares of produce and total annual turnover per site being analyzed?
- Construction would attract migrant labour, employed for a short period of time and then unemployed and dependent on the community around them for an income.
- In terms of the three objectives of the report as listed, the report fulfilled the first objective to a degree but was lacking when it addressed the potential impacts and mitigation measures. These need to be addressed!

RESPONSE 26

1st bullet (Value of agricultural land): Your statement is taken out of context. The Agricultural Assessment (Appendix E21 of the Draft EIR) deals extensively with the potential impacts of a nuclear accident on food production, and in this context, the value of agricultural land would be reduced. However, during normal operation of a nuclear power station, there is little if any impact on the value of agricultural land.

2nd bullet (Organic production): The agricultural specialist contacted a number of organic certification bodies to determine whether their organic certification criteria included any restrictions on proximity for a nuclear power stations. However, no such restrictions exist. The results of this research are indicated in the Agricultural Assessment (Appendix E21 of the Revised Draft EIR) included in the Revised Draft EIR). Customer concerns could be an issue, but the experience at Koeberg Nuclear Power Station is that such concerns disappear after the first few years of operation.

3rd bullet (Limits on increased agricultural production): The agricultural assessment to be included in the Revised Draft EIR indicated a number of ways in which agricultural production could be increased, or in which farmers could switch to different forms of agricultural production that would result in greater economic value.

4th bullet (Economic benefit not justified): The report does indicate the rationale behind its prediction of a potential increase in agricultural production. This is based on the following:

“Dairy farmers have a number of options available to increase production other than expansion. These include an improvement in management and an improvement in the nutrient value of planted pastures, which would result in an increase in milk produced per milking cow. Other market opportunities potentially could open, including the selling of raw milk or maas directly to consumers.

Alternatively, farmers may also switch production as has been done in the past (the region has moved from a predominantly wheat growing area to a dairy region mainly as a result of market forces). Therefore, for example, some farmers may switch to vegetable production if they believe this will be more profitable.”

5th bullet (Dust): Dust would be a problem at most during the first few months of construction, as one of the first actions that would be taken at the start of construction would be the tarring of existing dirt access roads such as the Humansdorp – Oyster Bay road.

6th bullet (Conclusions not justified): Please refer to the response to Bullet 4 above.

7th bullet (Figures missing): Values of livestock are deemed sufficient in terms of the recommendations contained within the report.

8th bullet (Migrant labour): This impact has been acknowledged in the social impact assessment and mitigation measures have been proposed to prevent and minimise it.

9th bullet (Did the report meet its objectives?): We take note of your opinion in this regard. Perceived limitations in the report have been addressed and an amended Agricultural Impact Assessment has been included in the Revised Draft EIR.

YOUR COMMENT 27

Tourism:

- The possible rise in sea levels is not expected to be significant during the life-cycle of the NPS and will therefore be of no effect! Therefore no “massive reconstruction and rebranding” necessary as envisaged by the specialist.
- The building of Nuclear 1 will have a great impact on future Eco- and cultural tourism (the area includes the existence of an incredible archaeological record comprising evidence of human occupation from Early Stone Age to the post-industrial age [few places in the world can boast this]. Why no comments in this or other reports?
- Is it really envisaged that the current tourism will be replaced by “*incorporate the existence and operation of a nuclear power station*”. Please justify!
- Suggesting that increased residential use will make up for loss of tourism is not correct. It has been calculated that there will be a loss of locals with the demise of the fishing industry!

- There are due to be international TV flightings of the squid spawning. This will have a major effect on local tourism and should be taken into account.
- It is stated that Thyspunt is predicted to experience a 7.86 % negative impact on tourism during construction and nil thereafter. How are these calculated?

RESPONSE 27

1st bullet (Sea level rise): Response from the tourism assessment specialist: This quote has been used out of context. The report clearly states that the NPS construction site would not be affected by a rise in sea levels. The statement about rebranding was made in relation to other tourist assets that might be affected.

2nd bullet (Impact on eco- and cultural tourism): Response from the tourism assessment specialist: No fatal flaw that could affect the tourism study was mentioned by the specialists dealing with this subject at any of the integration meetings, and therefore it was not taken into account.

3rd bullet: Response from the tourism assessment specialist: This comment is not in grammatical English and we cannot make any sense of it.

4th bullet: (“Demise” of tourism): Response from the tourism assessment specialist: Talking about the demise is speculative at best. The growth of the resident population and business tourism is what happened at Koeberg and more recently at Lephalale (formerly Ellisras) in relation to the construction of the Medupi coal-fired power station, and there is no reason why it would not happen at Thyspunt.

5th bullet (TV flighting of squid spawning): Response from the tourism assessment specialist: It is unclear when the TV programme will be filmed, but it may be assumed that it is planned for well before work on a nuclear power station commences. In any event, the contention that such a TV flighting would necessarily have a major impact on tourism is speculative at best.

6th bullet (Impact calculations): The rationale for the calculations was explained in detail in Section 4.4 and Table 4.6 of the Tourism Assessment (Appendix E22 of the Draft EIR).

YOUR COMMENT 28

Noise Impact:

- How can Koeberg be used as a model when the technology may be completely different?
- It is stated that the cumulative noise impact would be high throughout the construction period. The combined road traffic would cause the noise level to exceed the 65dBA limit contained in the NCR.
- How can the specialist state that there will be no noise impact due to the construction of the eastern access road when it is extremely close to Sea Vista, a school, a proposed new residential area and a retirement area?
- What about the road upgrades?
- Traffic and road construction noise will have a great effect on the dairy industry. This must be fully dealt with!
- It is stated that *“the existing and future LReq,d would comply with the 65 dBA limit. With the addition of Eskom traffic the cumulative noise impact would be high throughout the construction period. The combined road traffic would cause the noise level to exceed the 65 dBA limit contained in the NCR, necessitating noise mitigation procedures to be implemented. However, the situation has arisen due to the uncontrolled use of land typical of informal settlements. It may well be debated whether the onus for compliance with the NCR would rest with Eskom.”* This certainly requires further comment taking into account the municipality’s Spatial Development Plan!

RESPONSE 28

1st bullet (Koeberg as a model): Response from the noise assessment specialist: Please refer to section 3.1.3 of the Noise Assessment (Appendix E23 of the Draft EIR). The source of noise emanating from a nuclear power station is independent of the nuclear technology. The noise emanates entirely from fans that are used to cool the electrical transformer oil.

2nd bullet (Noise limits to be exceeded): We take note of your comment.

3rd bullet (Eastern access road): The prediction on noise impact is based on a combination of the distance to sensitive noise receptors, topography and the nature of the noise source. For Thyspunt the nearest noise sensitive land to the proposed eastern access road off the R330 would be an informal settlement at Sea Vista, 400 m from the noise source. Given the examples in the table below (Table 7 of the Noise Impact Assessment), no noise impact due to the construction of the eastern access road is anticipated. No noise impact associated with the construction of new roads to the alternative sites is therefore anticipated, excepting the western access road to the Thyspunt site that would pass within 230 m of the Umzamowethu township. In the latter instance the following recommendations are made:

- Construction processes and machinery/vehicles with the lowest noise emission levels available must be utilised.
- A well planned and co-ordinated “fast track” procedure is implemented to complete the total construction process in the shortest possible time.
- Construction work near residences only takes place during normal daytime working hours. No construction activities are to be permitted during weekday evenings and night-time, on Saturdays after midday and the entire day on Sundays.

L_w emission of heavy-duty machinery and separation distances required for reduction of L_{Req,d} to 50 and 45 dBA, respectively

Machinery & operating conditions	L _w , dB	Distance (m) to reduce to 50 dBA	Distance (m) to reduce to 45 dBA
CAT D11 bulldozer moving earth, reversing and repeating – several cycles	115	448	711
CAT5130B front-end loader loading CAT777D truck after approaching and subsequently leaving loading area – several cycles	112	271	443

4th bullet (Road upgrades): It is unclear what the respondent is asking. For an assessment of the impacts of the proposed road upgrades, please refer to Sections 3.6.1 and 4 of the Noise Assessment.

5th bullet (Noise impact on the dairy industry): Most of the receptors are located in excess of 70 km from the R330 and this combined with the fact that there is existing background noise as a result of the R330 and that the increase in traffic will be incremental and not sudden, results in the impact on the dairy industry being low in significance.

6th bullet (Impact on informal settlements): The point made by the specialist is that, if the informal settlement had complied with setback lines applicable to public roads (through enforcement by the local authority), then the impact would not have occurred, or its significance would have been reduced, as the informal settlement would have been situated further from the road. The impact can, therefore, not be wholly attributed to the proposed Nuclear-1 project.

YOUR COMMENT 29

Human Health:

- Once again, the identity of the specialists is not clear. There is no indication and no one is obvious from the list of CVs. Does this subject come within the ambit of the NNR?
- The report seems to be by HHRA - Who, where when, why, how? Do these conform to NEMA requirement and the final terms of reference?
- The arguments regarding radiological risks are that the NNR determines what level of exposure is acceptable; Eskom will operate within those parameters, and everything will be fine. Radiological impacts always appear to be theoretical, based on desktop studies, complex calculations and many assumptions, which are susceptible to manipulation. It would be more reassuring to the public if there was evidence of thorough follow-up investigation of changes in radio-activity in fruit, vegetables, dairy products, crustaceans, molluscs etc. in the area surrounding Koeberg and other installations (sic) of the type envisaged! This should then indicate what the implications for human health might be. Our understanding is that reporting on these changes ended in about 1990. This is specifically requested by the DEA in its letter to Arcus Gibb, dated 19 November, 2008.
- It is necessary to comment on any independent epidemiological studies on changes in the incidence of thyroid and other forms of cancer in the area surrounding a nuclear installation such as Koeberg.
- It is noted that the list of references does not include publications by respected critics of nuclear power generation. Recent publications reflect years of scientific research and study, and are written by respected scientists. They are very relevant to the whole debate, and affected parties are fully entitled to know the precise risks involved in living in proximity to (and down-wind from) such plants. Eskom's views should not be expounded while other arguments are ignored.
- The Generation 111/11 debate is relevant. Why is this not included?
- Why does the report not include details of what specific radio-nuclides may be emitted, and what their decay periods are? If they take the form of Strontium 90, or Caesium 131, with half-lives of 30 years, and decay period to "natural" levels of 200 – 300 years this must be commented on. Cumulative impacts over the entire operational life of the plant must be addressed.
- Uranium mining and nuclear reactors do not just affect this generation alone. Radioactivity pollutes for thousands of years, destroying human DNA and affecting that very basic of human functions including reproduction and health. Has the consultant investigated this as compared to other alternative generation methods?
- We believe that the public is entitled to full transparency with regard to health matters. We require that they be included in a second Draft EIR!

RESPONSE 29

Considering the background to the HHRA study, we respond as follows:

1st and 2nd bullets (Identity of HHRA report specialist): The report was prepared by Dr Willie van Niekerk of Infotox. HHRA refers to Human Health Risk Assessment. Dr van Niekerk's CV was included in Appendix E1 of the Draft EIR.

3rd bullet (Level of exposure): The level of exposure is based on scientific calculations, undertaken for the Air Quality Assessment (Appendix E10 of the Draft EIR), of the emission of radioactive substances from the proposed power station. These calculations are based on the experience with Koeberg Nuclear Power Station and on data on emissions associated with the proposed power station design.

4th bullet (Thyroid cancer): Quantitative cancer risk assessment was not required in the terms of reference under which the Human Health Risk Assessment completed and accepted. The qualitative nature of the EIR did not warrant comprehensive literature studies on radiogenic cancers.

6th bullet (Generation III): The Air Quality assessment, on which the Human Health Risk Assessment was based, took into account emissions of a Generation III plant.

7th bullet (Data on individual radio-nuclides): Response by the air quality specialist: A total of 98 different radionuclides were included in the assessment. Emissions for these radionuclides were given for the Areva and Westinghouse designs. They were all used together to calculate the dose. This dose is the sum of doses due to each isotope through inhalation, cloud shine and ground shine. To look only at the emissions and air activities of three radionuclides in isolation does not provide a meaningful and complete impact assessment. Nonetheless, these activities have been included in the report. Tritium is responsible for 98% of the total dose from Koeberg. Strontium-90, Iodine-131 and Cesium-137 combined contribute 1% of the total dose. Thus, the air quality assessment does in fact constitute a cumulative assessment as it considers all possible radionuclides.

8th bullet (Consideration of other forms of power generation): This application for environmental authorisation relates specifically to the impacts of a Nuclear Power Station at one of on three specific sites: Duynfontein, Bantamsklip and Thyspunt. It is not the intention of this EIA, neither was it required by the DEA approval of the Plan of Study for EIA, to perform a full life cycle analysis of the impacts of nuclear electricity generation in comparison to other forms of electricity generation. However, reference is made to the life cycle impacts of different generation options in Section 4.2.2 of the Draft EIR and revised Draft EIR. This includes an assessment of the land area requires for wind generation, which has been touted as a feasible alternative form of generation by many interested and affected parties in the Thyspunt area.

9th bullet (Transparency): The Air Quality Assessment and Human Health Risk Assessment have always been transparent.

YOUR COMMENT 30

Transportation

- The report is limited to elementary back-ground information which appears to have been done using a “desktop” approach, but may have included a visual inspection of the routes to the “Port” (Port Elizabeth?) and waste storage site (Vaalputs?). This is questionable - according to the AA the distances are incorrect.
- Existing and future projections (5, 10, 50 years) of the transport network are required (this to include the transport of hazardous materials).
- The draft EIA report on transportation matters in respect of the Thyspunt Site consisted mainly of detailed traffic engineering assessments for various road intersections between Humansdorp and St Francis Bay. Some of these are incorrectly noted and are out of date.
- The following short comings in the draft report are noted:
 - Projected traffic counts do not include the numbers and routes of construction vehicles carrying cement, stone and aggregate. The traffic figures are required to be upgraded.
 - The proposed route through Humansdorp down the main road of the town would inevitably result in traffic accidents and their associated social costs to the community.
 - The proposed route for the majority of construction and material vehicles through Humansdorp along the R330 to St Francis Drive in St Francis Bay does not take into account the proximity of low cost housing adjacent to proposed route, dairy farming activities adjacent to route and the minimum of two schools whose entrances are on proposed route as well as at least four schools where the school is situated on the opposite side of the road from where the majority of the learners live. Not to mention the number of busses (sic) and cars transporting learners to and from schools that use this proposed route as well as the number of learners who walk along the side of the road.
 - As there are no pedestrian bridges or side roads / pavements a number of pedestrians walk on the verge at any time of the day or night as it is the only route from their homes into Humansdorp.

- Cattle, goats and pigs roam freely in this area and have already resulted in a number of accidents.
- These activities adjacent to a heavily trafficked road would result in future road fatalities and the resultant social cost to the community.
- A number of busses (sic) transport learners from St Francis Bay to Humansdorp as well as just beyond the van Stadens Bridge (to Woodridge School) daily.
- Details were not supplied in the report on the effect of the increase in vehicular axle loads would have on the existing paved roads and road bridges between Humansdorp and St Francis Bay. Existing roads would probably have to be upgraded and widened due to the increase of load.
- Road bridges would have to be strengthened to sustain the loads of the extra heavy duty loads to be transported to Thyspunt.
- If the Kromme River Bridge's future strengthening or width requires the construction of additional piers this could result in silting of the river with its subsequent impact on tourism and also potential property buyers who wish to settle in the area. This matter needs to be investigated in much greater detail in the report.
- Details of the proposed new access road from St Francis Bay along the sensitive Sand Dune Area to Thyspunt were not given in the report. The effect of this road on the dune geomorphology has not been investigated in the report.
- Details of access and haul roads across the Sand River dunes at Thyspunt are not given in the report. Mention was made at public meetings at the Links Golf Course on the 25th May 2010 of constructing an elevated roadway supported by concrete columns and the possible use of a conveyor belt system for the transport of sand. Any disturbance of the Oyster Bay Dune Field would cause significant secondary impacts on the wetlands and on the dune geomorphology. This must be reported on!
- No mention was made in the report of any investigation of constructing an alternative access to the Humansdorp / R330 / St Francis Bay route. This alternative route should have been investigated.
- Can van Staden's River Bridge take loads approaching 1000 tonnes? If no, what upgrades are required and at what cost?
- It is noted that the proposed extra heavy duty loads (a minimum of 4 such loads) will not be able to make the 90 degree turns, of which there are a number on route.
 - The existing off ramp from the N2 from Port Elizabeth requires a 90 degree turn at the top of the ramp to get onto the Humansdorp road. Construction of an alternative off ramp would have to be undertaken.
 - The existing main road through Humansdorp also culminates in a 90 degree T- junction.
- The small road over the river bridge 3kms to the east of Humansdorp on the R330 has extremely sharp approach and exit ramps and would not take these loads.
- It was previously stated at a public meeting that a 90% turn for the abnormal extra heavy duty loads requires a turning circle of up to 1500m in length to make a 90% turn. Major road works to the approach and exit of bridge could be required; this matter should be investigated in the report.
- The upgrading of the N2 and the strengthening of the various road bridges on the N2 and R330 roads for the extra heavy duty loads was not investigated in the report. Why was this not included in the consultant's scope of investigation nor included in the economic costing?
- Numerous bridges on the N2 Highway will have to be assessed for vertical clearance &/or load carrying capacity to process the expected abnormal loads to Thyspunt. A recent count revealed approximately the following:

Roads over bridges (incl. Van Stadens, Gamtoos, Kromme)	11
Roads under bridges (with off-ramp)	12
Roads under bridges (without ramp)	13
- The unpredictability of the Sand River flash floods was not investigated as well as this bridge's carrying capacity.
- The subsurface of the existing road from St Francis Bay to Cape St Francis needs to be investigated. A large section of this road has already collapsed.

- The noise generated by additional vehicular and construction loads along St Francis Drive and in Humansdorp might require the construction of sound barriers along the road to reduce the noise level. This matter was not investigated and needs to be addressed.
- The Thyspunt site has a significant impact on the transport network with upgrades required to the public transport system, heavy load routes and road upgrades required for emergency evacuation purposes.
- All these upgrades will contribute to the financial cost of construction of the power station at this site. Why is there no reference to this or the cost thereof?
- The siting of Construction and Staff villages and commuter implications must be investigated.
- The social impact of use of R330 for exceptionally heavy and heavy loads and for commuter traffic must be fully investigated.
- Realism and cost of constructing 10 km roadway for exceptionally heavy & heavy traffic on shifting dunefield possibly subject to plastic flow must be fully investigated and commented on;
- Did the specialist give any thought to the practicality of evacuating up to 30000 people, covering the coast line from Rebelsrus to St Francis Bay, via a network of rural roads, down one escape route, in 10 – 30 minutes, in the event of an emergency when the prevailing south-westerly wind was blowing? If not, why not? There is no possible disaster management plan which could achieve this, whether under peak or normal conditions.
- Studies of peak hour traffic are contained in Appendix C were not supplied.
- The report is purely concerned with the physical possibility of using various roads and intersections to transport the different types of traffic. There is no thought whatsoever given to the impact on the local community of such arrangements. The classic is the proposal to take all the heavy traffic down the Humansdorp Main Street, with a right-angled bend at the bottom. This will almost certainly involve demolition of buildings, and will transform the Main Street into a minefield of congestion and hazards. It is simply not acceptable to deliberately create traffic congestion on this scale in a commercial centre, which is already congested regularly while delivery vehicles block the road.
- The use of Main Street in Humansdorp itself is a non-starter. The report takes no cognisance of high volumes of shoppers and the resultant pedestrian traffic. This cannot be permitted, and alternative routes should be sought and costed.
- The very fact that such a proposal could be made, without discussion of its implications or possible alternatives, raises serious questions regarding the competence or due diligence of the specialists. Has the Municipality been consulted on such a major issue?
- Heavy loads, surely, must be one of the most serious challenges to the selection of the Thyspunt site. We are looking at loads of up to 1000 tonnes, 42 metres in length, between 5.3 and 8.2 metres in width, and presumably of equivalent height. These have to be conveyed from Port Elizabeth Harbour (why not Nqura?), through the streets of Port Elizabeth, along the N2, passing over and under numerous bridges, including Van Stadens River, Gamtoos and Kromme River bridges, through Humansdorp, along the R330 and a new road to be constructed over sand dunes which could be subject to plastic flow under wet conditions. In such a context it would be reasonable to assume that a detailed indication would be given in the transportation assessment of the reality, implications and cost of such an exercise. Not done! The entire matter is covered in one page - most of which is devoted to a description of the loads and their carrying vehicles.
- It is said is that a 1988 (Drennan) report investigated the feasibility of transporting heavy loads from Port Elizabeth harbour to the Thyspunt site, and that if the movement of exceptionally heavy loads is required, Eskom will undertake a detailed study of the transportation route from Port Elizabeth harbour to the Thyspunt site. Nothing else is said about the findings of the Drennan report. When is this detailed study expected?
- There is reference to a preliminary assessment of the route undertaken as part of the study. The preferred route was allegedly contained in Fig 10.14, which does not appear on the CD or hard copy.
- There is no reference under “mitigation” to determining the capacity of the N2 or the costs of up-grade to enable it to carry exceptionally heavy loads.
- There is no reference at all to the social impact of the vast traffic volumes predicted. Does the traffic assessment specialist consider this to be outside his area of concern? This needs comment!

- Assuming that the accommodation will be situated in or near Humansdorp, why can commuter traffic not use the Oyster Bay road during the construction period?
- How is it that the traffic assessment pays no attention to the 10/12 kilometres of roadway required from the R330 to Thyspunt, over shifting sand dunes? Is this feasible and at what cost?
- No report at all is made on aviation despite there being a very well used airfield within about 12km of the site. This requires full investigation!
- How can the public react responsibly when crucial information, such as diagrams and Appendix C are omitted from both the CD and hard copy?
- There is no reference at all to the cost of the various traffic measures to be taken. This is, or should be, a major consideration in determining the viability of the Thyspunt site.
- There is no discussion whatsoever of the findings of the preliminary assessment.
- Once again, we are faced with lack of material information and fragmentation of the whole EIA process. The transportation route is a key element in determining the viability of the site. Whether or not the road system is able to sustain the loads required; what up-grades will be needed, and, above all, at what the cost, would be one of the very first considerations for any business venture considering such a proposal. Here it is being treated as an after-thought on a project costing many billions of rands.
- A Traffic Management Plan still has to be devised. On the other hand, we would like the Traffic Management Plan to impose strict limits on the use of the R330 for normal heavy loads. To have heavy traffic passing St Francis Bay during the night would be intolerable. There is no reference to this. This report is a model of complacency and incompleteness. None of the major issues raised at the beginning of this review have been addressed. Even the simple technical exercises undertaken on road access and intersections show naivety (an example being the use of Main Street in Humansdorp)
- There are so many uncertainties remaining that this document can at best be regarded as a preliminary enquiry. Surely this cannot be the final document for an Environmental Impact Report?
- All of this leaves huge questions unanswered, notably in relation to modifications to the N2 and the impact of all this traffic down the main street in Humansdorp.
- Presumably the total report will be redone in its entirety!

RESPONSE 30

1st bullet (distances to Vaalputs): Depending on the source consulted, the distances will not be exactly the same in each instance. Nevertheless, the distances have been checked and any necessary revisions will be included in the Revised Draft EIR.

2nd bullet (Projections): it is unclear how projections of future transport could be made 50 years into the future. Such projections would be purely speculative and would serve little purpose.

3rd bullet (Road intersections from Humansdorp to Thyspunt): If found, any such claimed inconsistencies will be corrected in the revised Draft EIR.

4th bullet (Projections): More recent traffic figures have been included in the amended Traffic Assessment to be included in the Revised Draft EIR.

5th bullet (Route through Humansdorp): We take note of the comment. It is for this reason that an alternative route around Humansdorp has been identified and will be included in the Revised Draft EIR

6th bullet (Schools in proximity to the R330): Your comment is noted. Eskom has indicated its willingness to construct pedestrian overpasses at critical points along the route close to schools, or where learners cross the road. A number of other mitigation measures have also been recommended in the traffic assessment.

7th bullet (Pedestrians on verges): We take note of the comment. This issue will be addressed in the amended Traffic Assessment.

8th bullet (Livestock on roads): We take note of your comment.

9th bullet (Road fatalities): We take note of your comment. A number of mitigation measures are proposed in the traffic impact assessment to prevent road fatalities.

10th bullet (School buses): We take note of your comment.

11th bullet (Impact of increased axle loads): Correct, the R330 pavement's structural integrity will be tested for the additional loading and will in all probability require strengthening.

12th bullet (Bridge upgrading): Initial assessment of the ultra heavy routing from Port Elizabeth harbour via the N2 to Thyspunt has been completed. The initial recommendation is that the routing is feasible and will require some construction of bypasses around some overpasses and interchanges. Detailed design work is required to transport the ultra heavy loads over some bridge structures to ensure acceptable loading on the structure. However initial indications are that it is entirely feasible. Transport of these loads will occur in off-peak periods, as approved by the road authorities.

13th bullet (Strengthening of Kromme River Bridge): Please see the above response.

14th bullet (Eastern Access Road): Details of the road were discussed in Chapter 5 of the Draft EIR and indicated in Figure 5-8. In addition, the routing of the proposed Eastern Access Route was shown in all public participation meetings in the Thyspunt area. The effect on this road on the dune geomorphology has been investigated in the Dune Geomorphology Report (Appendix E2 of the Draft EIR. An addendum report, to consider the claims of debris flows on the stability of the grounds, was commissioned and will be included in the Revised Draft EIR.

15th bullet (Road across dunes): Section 9.28.2 of the Draft EIR provides a comprehensive comparison of the access routes to the Thyspunt site and comes to the conclusion that the Northern Access Route is not environmentally acceptable due to its potentially significant impacts on the dune system and its ecological characteristics.

16th bullet (Alternative access route): The routing has been investigated. Substantially the routing is over stabilized sands.

17th bullet (van Staden's Bridge): Current information is that no upgrades to Van Staden's Bridge are required.

18th bullet (Heavy duty loads): Your statement is correct. Upgrading of certain intersections and interchanges would be required.

19th bullet (Small bridge east of Humansdorp): We take note of your opinion in this regard. All bridges on the R330 route have been assessed and found to be suitable.

20th bullet (Extra heavy loads): Please refer to the response to Bullet 18 above.

21st bullet (Bridge upgrading costs): Final costs of mitigation and upgrading have not yet been determined. Eskom is prepared to pay the full costs of the recommended mitigation. Detailed work will determine final costs.

22nd bullet (N2 bridges): We take note of your comment. Please see our response to bullet 12.

23rd bullet (Sand River floods): The 2009 flood at St. Francis has been investigated in the Addendum Report to be included in the Revised Draft EIR.

24th bullet (Subsurface of St. Francis bay to Cape St. Francis Road): Your comment is noted although not clearly understood as this section of the R330 will not be impacted during the construction or operational phase of the Nuclear Power Station.

25th bullet (Noise barriers): Appropriate mitigation has been addressed in the Noise Impact Assessment (Appendix E23 of the Draft EIR)

26th bullet (Upgrades required): Your comment is noted. It is correct that upgrades are required.

27th bullet (Costs of access roads): Capital costs of access roads are included in the Economic Impact Assessment (Appendix E17 of the Draft EIR).

28th bullet (Location of construction camps): As stated in the public meetings for the EIA phase, the staff villages will be located in Humansdorp and Jeffreys Bay, based on preliminary discussions between Eskom and the municipality. However, the exact location of the staff villages has not yet been determined and will only be confirmed once (and if) an authorisation is issued for the proposed power station.

29th bullet (Social impact of extra heavy loads): There will be temporary disruption of traffic due the passage of extra heavy loads, as these vehicles travel at very low speeds. However, there will be a very low frequency of these vehicles. A maximum number of such 13 trips per annum will be undertaken during the peak of construction, between years 3 and 6 of construction.

30th bullet ("Plastic flow"): As indicated in the response to bullet 14 above. The findings of the "debris flow" addendum report is that there is no evidence that the Thyspunt site is subject to debris flows and that the site is not characterised by the geomorphological and slope conditions required for the development of debris flows. The opinion of the above specialist is that the evidence of supposed debris flow deposits provided by Dr Ellery are river flood deposits of sand, some mud, pebbles, and some plant debris, that were entrained and later deposited by the Sand River when in flood.

31st bullet (Evacuation): Evacuation would only be required within the 3km radius of the site. It is therefore not correct to state that up to 30000 people would have to be evacuated, as St. Francis falls is located more than 10 km from the proposed Nuclear-1 site.

32nd bullet (Peak hour traffic projections): Peak traffic projections are provided in Section 3.21.3 of the Revised Draft EIR.

33rd, 34th and 35th bullets (Impact on Humansdorp main road): Please refer to the response to Bullet 5 above. An alternative route around Humansdorp has been proposed and will be indicated in the revised Draft EIR.

36th bullet (Extra heavy loads): Please see our response to bullet 12. Also please note that the Transportation assessed has been revised as part of the Revised Draft EIR and will be made available for public comment and review.

37th bullet (Drennan report): Please see our response to bullet 12. Also please note that the Transportation assessed has been revised as part of the Revised Draft EIR and will be made available for public comment and review.

38th bullet (Figure 10.14): Incorrect figures have been corrected in the Revised Draft EIR.

39th bullet (Costs of N2 upgrade): As indicated in the response to Bullet 27 above, capital costs of access roads are included in the Economic Impact Assessment (Appendix E17 of the Draft EIR).

40th bullet (Social impacts of traffic): This is not within the terms of reference of the traffic specialist. Social impacts of traffic are dealt with variously in the noise, visual and social impact assessments.

41st bullet (Commuter traffic use of the Oyster Bay road): A split between construction traffic using the Oyster Bay Road and construction traffic using the R330 is proposed in the Revised Draft EIR. A split of between 40% Oyster Bay Road: 60% R330 to 30% Oyster Bay Road: 60% R330 is proposed.

42nd bullet (Road over sand dunes): Please refer to the response to Bullet 30 above.

43rd bullet (Airfield): Airports and airfields in proximity to the Thyspunt site are discussed in Section 3.3.5 of the Transport Assessment (Appendix E25 of the Draft EIR).

44th bullet (Omitted information): Please refer to the response to Bullet 38 above.

45th bullet (Costs): Please refer to the response to Bullet 27 above.

46th bullet (Preliminary assessment): It is uncertain which preliminary assessment is being referred to in this comment.

47th bullet (Assessment of road system): Your comments are noted. In terms of the ability of the road system to sustain loads, as previously mentioned Initial assessment of the ultra heavy routing from Port Elizabeth harbour via the N2 to Thyspunt has been completed. The initial recommendation is that the routing is feasible and will require some construction of bypasses around some overpasses and interchanges. Detailed design work is required to transport the ultra heavy loads over some bridge structures to ensure acceptable loading on the structure. However initial indications are that it is entirely feasible. Transport of these loads will occur in off-peak periods, as approved by the road authorities. Final costs of mitigation and upgrading have not yet been determined. Eskom is prepared to pay the full costs of the recommended mitigation.. Detailed work will determine final costs.

48th bullet (Traffic Management Plan): Your comments are noted. GIBB stands by the findings of the Traffic Impact Assessment although the routing of traffic through Main Road Humansdorp has been reviewed as a result of public submissions and is addressed in the revised Transport Impact Assessment Report. A Traffic Management Plan will be prepared after the development is authorised by all appropriate authorities.

50th bullet (Inadequate report): GIBB stands by the content of the report. Any inadequacies found in the report will be addressed in an amended version to be release for comment with a Revised Draft EIR.

51st bullet (Questions unanswered): Please refer to the response to Bullet 5 above regarding the issue of the Humansdorp main road.

52nd bullet (Report to be redone): The report is being revised and will be provided for comment in the Revised Draft EIR.

YOUR COMMENT 31

NOTES:

- a) The context of this proposal is to place a huge industrial plant, at an estimated cost is in excess of R100 billion, with all its associated infra-structure, on a section of sensitive virgin coastline, some of which is of high conservation value, on a major tourism route, adjacent to well-established and world-renowned resorts, with an existing economic system based on tourism and fisheries, both of which could be threatened, with consequent loss of sense of place, and without consideration of alternative sites. An unpredictable dynamic landscape is no place for a possibly lethal infrastructure!
- It is astonishing to us that a utility such Eskom, which prides itself on its environmental sensitivity, would even contemplate such a development without having first excluded all other possibilities.
 - It is also remarkable that a body such as the Department of Environmental Affairs would even consider allowing such a development. It raises questions as to why we have such a

department at all, and whether there may not be political interference in favour of a positive outcome.

Any approval of the DEIR in its present state, with major areas still undecided, and with so many gaps in the specialist reports, would be tantamount to extreme bias in favour of the developer.

- a) The dynamics of the dunefield and associated wetlands are not sufficiently well understood to enable mitigation against catastrophic events. We are dealing here with a system that comprises dynamics underpinned by the movement of sand, water and slurry (water-saturated sand). The last-mentioned was not appreciated by the experts; represents a threat to infrastructure; this risk has not been considered in any of the relevant reports; in the longer term, in association with climate change, rising sea levels and increasing wind and wave regimes, will re-supply re-energize the by-pass dunefield in a way that is very difficult to predict. The bottom line is to reduce risk by placing the infrastructure in a more stable area.
- b) It is our view that environments such as Thyspunt are a scarce resource and should therefore be regarded as part of South Africa's heritage, and only be disturbed if all other options have been exhausted!
- c) It is claimed that Generation 111 conforms to European Utility Requirements, and qualifies for reduced Emergency Planning Zones of 3 kilometres. This has immense significance for siting criteria, and raises the possibility of placing NPS closer to population centres, where they are required. This should lead to a total reassessment.
- d) The new environmental legislation requires very specific and detailed investigations into the potential environmental and social impacts of any proposed development, including the investigation of alternative sites. Consultants Arcus Gibb argue that their brief only extended to Nuclear-1 (i. e. the first of the proposed five plants, and that they considered alternative sites in the form of the five sites originally selected in 1980. The community argues that Nuclear-1 is part of a much larger project, which will eventually include all five sites, and that this precludes regarding these sites as alternatives. It is highly questionable whether Thyspunt would have been selected as a site, had the original brief to Arcus Gibb have been to select the most suitable site in the Eastern Cape in the light of contemporary realities. Eskom's brief to Arcus Gibb is clearly deficient in this respect.
- e) There is little sign that Eskom has taken these changes into account in its present planning. It has taken the five sites selected 30 years ago, and looked at no others. There would appear to be an assumption that all five sites are suitable, and that the only decision is which to develop first. Everything points to rushing the EIA process through as quickly as possible, as little more than a formality, paying lip-service to the process, with a pre-determined outcome, and public participation relegated to little more than tokenism. Extreme leniency is being applied, on the grounds that the project is "in the national interest". The result is the probability of a huge, environmentally and socially invasive, and possibly unnecessarily costly, industrial development on an unspoiled piece of coastline, and total change of character for a successfully developing adjacent tourism area, when potentially preferable sites are not even considered. This could legitimately be described as environmental vandalism, or an environmental tragedy. How this is consistent with the right to just administrative action as contained in the Bill of Rights, is not clear.
- f) Since the Thyspunt site was selected in the early nineteen eighties, a number of important political, legislative, economic, and technological changes have taken place. These include:
 - Advances in nuclear technology, resulting in Generation 111-type PWRs, with improved safety margins and reduced EPZs.
 - i. Growth in the economy of the Eastern Cape, notably the Coega IDZ, with demand for a power station here;
 - ii. Huge cost increases in the provision of associated infra-structure.
 - iii. Major new environmental legislation, imposing strict rules, specifically designed to protect the natural and social environment.
 - iv. Reunification of South Africa into one single state, and adoption of a model constitution, with its emphasis on public participation;
 - v. Neglect by Eskom and government over a period of 10 years of warnings that South Africa would soon be short of power generation capacity, with resultant need to rush through measures to address this.
 - vi. The advantages of Coega have not been considered as an alternative, despite assurances that the site would be investigated. These include

- Industrial Development Zone, with an large power requirement
- Environmentally down-graded area
- Deep-water harbour adjacent
- Excellent road system in place for delivery and emergency evacuation
- Two sub-stations close by
- Source of potential labour in Motherwell.
- Prevailing wind off-shore
- Sizeable areas of undeveloped coastal land.
- Savings in transmission costs (billions!)

The only known disadvantage of Coega is the seismic fault and less favourable geology and this can easily be catered for. Should Coega prove unsuitable with mitigation, then Eskom should be seeking a site mid-way between Port Elizabeth and East London, which are the two economic hubs of the Eastern Cape.

RESPONSE

See responses to these issues above.

YOUR COMMENT

CONCLUSION:

- b) This submission shows that there are serious shortcomings in the EIA process being followed for Nuclear-1, and the specialist reports commissioned in terms of this EIA ignore numerous areas and others are incomplete. It is our view that the entire EIA process should be discontinued pending decisions on material information such as the specific technology to be used. It should then be done correctly.
- c) Furthermore, it is our contention that the NNR process should run in parallel with the EIA process, and not be divorced from it, since some aspects are inter-related.
- d) We believe that there should be a complete review of the Thyspunt site and consideration of alternative sites, in the light of the many changes which have occurred since Thyspunt was selected in the early nineteen-eighties . This should include Coega.
- e) At the very least, there should be a second Draft Environmental Impact Report before this is submitted to the DEA for an ROD.

RESPONSE

Your comments are noted. The Draft EIR has been reviewed and will be made available for public comment and review.

Should you have any queries with respect to the above please do not hesitate to contact Arcus GIBB.

Yours faithfully
For Arcus GIBB (Pty) Ltd



Jaana-Maria Ball
Nuclear-1 EIA Manager