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Dear Dr Alan Boyd

RE: ESKOM EIA CONCERNS FOR THE PROPOSED NUCLEAR POWER STATION AND ASSOCIATED INFRASTRUCTURE (DEA Ref. No: 12/12/20/944)

COMMENTS ON THE PROPOSED CONSTRUCTION, OPERATION AND DECOMMISSIONING OF THE PROPOSED NUCLEAR-1 POWER STATION AND ASSOCIATED INFRASTRUCTURE

Comment 1:

I would like to thank you behalf of the Oceans and Coasts Branch of the Department of Environmental Affairs, for the opportunity to comment on the draft Environmental Impact Report (EIR) as well as the comprehensive presentation to DEA staff and the Review Panel at the workshop held between the DEA and Arcus GIBB (Pty) Ltd as the Environmental Assessment Practitioners (EAP) on the 28th July 2011.

The proposed Nuclear-1 station, as well as any others that may be proposed in future, will be planned for construction and operation within the coastal zone, due to the cooling requirements of the nuclear station which require large amounts of seawater as a coolant source. Due to the fact that this is the first proposed nuclear site since comprehensive environmental legislation is in place, as well as the likelihood of proposals for additional nuclear stations in the near future for the provision of the projected 40 000 MW requirements for South Africa, it is imperative that Integrated Coastal Management (ICM) concerns and information on any and all ICM implications are provided to the EAP for the Nuclear-1 project, to ensure that coastal development requirements and the prevention/minimisation of adverse effects on the coastal environment are taken into account.

The following ICM areas of consideration, prepared by the Chief Directorate: Integrated Coastal Management (CD ICM), were deduced from the review of the draft EIR, presentation by the EAP at the workshop, as well as general discussions during the workshop:

1) Noting, Utilisation and Consideration of Current Legislation and Regulations

The current revised draft EIR does not take note of the Integrated Coastal Management Act, 2008 (No. 24 of 2008) (ICM Act) as well as the latest activities within the listing notices of the 2010 EIA regulations. It is therefore recommended that the EAP takes note of the above and reviews the list of activities for coastal developments that may be triggered for coastal activities that has been prepared by the Directorate: Coastal Conservation Strategies of the CD ICM and which will be sent to you shortly.

Response 1:

Chapter 6 of the Revised Draft EIR provides a discussion of the implications of the National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008) for the Nuclear-1 project.

Your reference to the 2010 EIA listing notices refers. Please note in this regard that the application for Nuclear-1 was lodged in terms of the 2006 EIA Regulations (Government Notices No. R 385 to 387 of 2006) and that, in terms of the transitional arrangements provisions of the 2010 EIA Regulations, any application commenced under the 2006 Regulations continues under the requirements of the 2006 regulations. Thank you for alerting us to the requirements of the National Environmental Management: Integrated Coastal Management Act, 2008 (NEM: ICMA) in terms of coastal activities. The development of Nuclear-1 is subject to authorisations under a number of different pieces of legislation and from different authorities at local, provincial and national government level. It is estimated that more than 30 different authorisations will be required. Eskom is aware of these authorisations and will engage with the relevant authorities.

Comment 2:

2) Discharge of Effluent and Dumping Considerations

A multitude of considerations from a Marine Pollution perspective were raised at the workshop by CD ICM officials, namely:

- Intake and Outlet pipelines for the Nuclear-1 station, including near-shore and offshore pipelines for the abstraction of seawater, discharge of heated seawater back into the receiving environment (12 ° Celsius differential);
- Intake and Outlet Pipelines for a multi-nodal desalination plant as associated infrastructure, with multiple intake and outlet points for the abstraction of seawater and subsequent discharge of hyper-saline (potentially 50 - 100 times more than normal seawater), heated effluent;
- The discharge of fine-spoil effluent resulting from excavation activities;
- The dumping/disposal of larger sediment spoil out to at sea;
- The possibility of intermediate to high heavy-metal loads in effluent as well as dumped materials; and
- Radiological implications for effluent and dumped materials.

Response 2:

Your comments are noted. These aspects have been assessed in the relevant specialist studies (Appendix E) included in the Revised Draft EIR (Version 2).

Comment 3:

3) Authorisations in Terms of the ICM Act

In addition to the duty of care and environmental authorisations stipulated in NEMA, the EAP must also take into account sections 58 and 63 in the ICM Act, which speaks to the duty of avoidance of adverse effects on the coastal environment, and environmental authorisations for coastal activities respectively. The noting and adherence to these sections are imperative to the compliance with ICM principles by the EAP.

Response 3:

Your comment is noted. It is estimated that there are more than 30 different authorisations required for Nuclear-1 under the jurisdiction of various authorities at local, provincial and national government level. It is not the intention of the EIA process, neither it is possible, for the EIA to address the requirement of all these authorisation requirements.

However, the avoidance of impacts on the coastal environment is accepted as an important principle in environmental management and where possible, impacts on the coastal environment have therefore either been avoided or mitigated as far as possible, bearing in mind constraints of a project

that is restricted to coastal sites and cannot be located inland due to the need for large volumes of cooling water. Impacts on the marine environment due to activities like spoil disposal and the release of warmed cooling water have therefore been modelled in detail and terrestrial-based impacts in close proximity to the coast have also been assessed. Furthermore, the potential impacts of future sea-level rise (including storm surges) have been modelled and the power stations have accordingly been placed at heights above sea level at which the impacts of such a rise in sea level would be mitigated. In recognition of the ecological sensitivity of the coastal zone and the high concentration of heritage sites in the coastal zone, an undeveloped buffer zone of 200 m wide (inland from the shoreline) will be maintained at all three sites.

Comment 4:

4) Off-Road Vehicle Permitting Protocols

Although Eskom as an entity is exempt from the requirement of Off-Road Vehicle (ORV) permits for the use of vehicles (construction or other) on the seashore on any of the localities, it must be noted that any external parties that may be contracted by Eskom for any activities relating to the development of the station and associated infrastructure on the seashore must be communicated by Eskom to DEA's Oceans and Coasts branch, including the provision of copies of the appointment letter or contract between Eskom and the contractor/sub-contractor as the service provider. Additionally, the impact on existing marine and coastal activity right/permit holders in each of the proposed sites that were not identified in the report must be taken into account, with special regard to any possible restrictions that Nuclear-1's safety and security measures may impose on these holders.

Response 4:

Your comment is noted. Eskom will communicate with the DEA's Oceans and Coasts branch if and when a contractor is appointed to ensure that the contractor applies for the necessary authorisations for the operation of off road vehicles in the coastal zone.

The security exclusion zone imposed by the National Key Points Act, 1980 (Act No. 102 of 1980) may result in loss of access to the coastal zone for current users. However, it is Eskom's intention to allow permitted access to this zone so that current economic activities such as fishing and harvesting of kelp for commercial abalone farms can continue.

Comment 5:

5) Hazard Zones and Setback Lines

The revised EIR, at present, has not considered the impact of the 800m development exclusion zone, as well as the 2-3 kilometre radial "owner controlled zone" on development setbacks in terms of NEMA, as well as any coastal setback lines that may be established by the respective coastal province for each of the proposed sites. These setback lines have the potential to conflict with the demarcated safety zones (particularly the owner-controlled zone) and as a result, the EAP must ensure that any potential legislative conflicts are accounted for and incorporated into the assessment factors for each of the proposed sites where necessary. Additionally, coastal Hazard Zones that are currently being developed by the DEA need to be taken into account and the EAP and Eskom should communicate with the Department on a regular basis throughout the finalisation of the EIA phase and beyond to ensure that all potential challenges and conflicting principles are addressed.

Response 5:

Your comment is noted and it is acknowledged that there is a potential for interaction between the zones established by different legal regimes. The Emergency Planning Zones (EPZs) of 800 m and 3 km likely to be established by the National Nuclear Regulator have the potential to be complementary to the zones being established under the NEM: ICMA, since the 800 m radius Proactive Action Zone would effectively prevent any private development within an 800 m radius of the proposed power station.

However, it must also be recognised that the EPZ are established for different purposes than the setback zones being established under the NEM: ICMA. The EPZs are defined in order to provide security to the power station and to provide radiological protection to the surrounding public, and to ensure that sufficient emergency evacuation infrastructure is available in the surrounding areas¹.

Coastal Hazard Zones and Setback Lines will be considered when they are formally gazetted by the responsible authorities. Eskom will maintain communication with these authorities in order to keep abreast of the development of these setbacks and to make inputs to their development with respect to the proposed alternative sites for Nuclear-1.

Comment 6:

6) Contingency Plans to Reduce Adverse Effects on the Environment

Several concerns were raised over the storage of high level irradiated waste known commonly as "spent fuel." The storage of the spent fuel is planned to take place on-site at the Nuclear-1 station. However, concerns were raised as to the storage capacity of the station, especially in light of Koeberg nuclear station's storage capacity for spent fuel, which is expected to reach storage limit capacity by 2013, some 12-17 years before its decommissioning. As a result, the potential for adverse effects on the coastal environment in light of the lack of a contingency plan to address this factor is potentially high and the need for contingency plans are urgent in this regard, as well as a specialist study in light of ICM concerns and challenges. Additionally, the transport of the low-level and intermediate level waste to the Vaalputs storage facility also raised health, safety and environmental impact concerns, for which there was also no contingency or management plan that is currently proposed.

Response 6:

Internationally, in situations where there is no long-term storage facility for the disposal of high level radioactive waste, it is an acceptable practice to store high level waste on the site of the nuclear power station. Eskom will continue to store HLW on site (Koeberg) until such time that the national disposal facility

Transport of low-level and intermediate level nuclear waste to Vaalputs will be done according to the appropriate provisions of the Regulations of the International Atomic Energy Agency (IAEA) for the Safe Transport of Radioactive Material. The objective of the Regulations is to protect persons, property, and the environment from the effects of radiation during the transport of radioactive material. According to these regulations, transport of nuclear waste is subject to the following provisions:

- an appropriate radiation protection programme to ensure adequate protection for workers and the public along the transport route. Compliance criteria for this purpose are published in the safety standards;
- an emergency response programme and procedures; and
- a quality assurance programme for the design, manufacturing, testing, documentation, use maintenance and inspection of waste packages to ensure compliance with the relevant provisions of the Regulations.

Emergency planning for Nuclear-1 falls within the ambit of the nuclear licensing process of the National Nuclear Regulator.

Comment 7:

7) Sediment Deposition and the Potential for Land Reclamation

The CD ICM is of the opinion that provision should be made for possible reclamation ramifications in terms of the ICM Act caused by the potential creation of sandbars and reclaimed land. As a result, it is recommended that the EAP takes section 27 of the ICM Act into account should the possibility of reclamation be considered as a likelihood in other/further modelling scenarios and scrutiny.

¹ It is to be noted that the EPZs apply only to the inland areas and do not apply seawards.

Response 7:

Reclamation is not being considered for Nuclear-1. Modelling of sediment movement has been modelled in the Oceanographic Assessment. This confirms that the proposed offshore disposal of spoil will not result in the creation of any new offshore areas. The offshore disposal areas are located deep offshore at all three alternative sites.

Comment 8:

8) Weighted Assessment Variables

It was observed that, as a general principle, environmental factors were not weighted as highly as those of engineering, economic or socio-economic in nature, as part of the assessment methodology and execution. It is therefore recommended that consideration towards the allocation of proportionate weighting to coastal environmental factors is undertaken, due to the coastal locality of all of the proposed sites.

Response 8:

Every discipline has different method and approaches to evaluating data and information. In the field of environmental management, the assessment and evaluation of environmental impacts has developed over the last three decades and includes a number of criteria that are applied almost universally in EIAs. These criteria typically include nature (is the impact negative or positive?), extent (or scale), duration, intensity (degree of change), consequence (seriousness), reversibility, probability (how certain is it that the impact will occur?) and significance (overall importance of the potential impact).

Although there is general agreement about the nature of the criteria for assessment and there are local and international guidelines on this, there is no single agreed method. It is up to the discretion of the environmental assessment practitioner (EAP) to apply his or her mind to determine the most appropriate combination of criteria, as well as any requirements that the environmental authority might have regarding the criteria. In the case of the Nuclear-1 EIA the EAP sought assistance from other senior EAPs, namely Mr. Neal Carter and Mr. Reuben Heydenrych, as well as an advisor on EIA process, Mr. Sean O'Beirne.

Furthermore, based on comments received from the DEA during the review of the RDEIR Version 1, The National Department of Environmental Affairs requested the EAP to review the impact assessment methodology used in the Revised Draft Environmental Impact Report (Version 1), so as to simplify the criteria for assessment of significance and identification of a preferred site. In response, an approach has been developed that identifies and describes key decision-making issues contained in the individual specialist studies. This updated assessment no longer utilises the ranking / scoring system for the sites, but rather considers the residual risks associated with the proposed Nuclear power station at the proposed sites. These decision-making issues apply to both the acceptability of the proposed Nuclear Power Station as well as to the preferred site. Please refer to Chapter 10 for the updated assessment approach.

Comment 9:

9) Cumulative Impacts

Although the EAP addressed the validity and degree of impact of each of the factors individually as well as by each respective sector (i.e. tourism, seismic, etc.), ICM believes that there is a need for further investigation into the cumulative impact of the Nuclear-1 station itself, as well as its associated infrastructure over time. Some of the particularly evident potential cumulative impact include, amongst others:

- The housing development for power-plant workers and the impact of the development on each of the proposed sites;

- The cumulative impact of the hyper-saline effluent and heated (possibly contaminant-laden) effluent into the receiving ocean environment;
- The cumulative effects of storage of spent fuel on-site;
- The impact on marine recreational and subsistence activities over time;
- Cumulative deposition of fine spoil in the marine environment; and
- The cumulative impact on dune systems, wetlands and the littoral active zone, which is the proposed location of the multi-nodal desalination plant at each proposed site.

Response 9:

Your comments regarding potential cumulative environmental impacts are noted.

- Cumulative impacts have as far as reasonably possible been assessed in Chapter 10 of the Revised Draft EIR (Version 2).
- The potential impact of the marine disposal of brine from the desalination plant has been assessed in the Marine Ecology Assessment (Appendix E15 of the Revised Draft EIR Version 1).
- It is acknowledged that the issues of radioactive waste management is important and integral to debate surrounding nuclear energy and as stated the only alternative currently available in South Africa is long-term storage of the spent fuel in the nuclear power station. However please note that a Radioactive Waste Management Institute has only recently been established. One of the functions of this institute will be to identify a repository for high level waste in South Africa..
- The potential short-term and medium-term impacts of the marine disposal of spoil as assessed in both the Oceanographic and the Marine Ecology Assessments (respectively Appendices E16 and E15 of the Revised Draft EIR Version 1).
- A comprehensive assessment of the impacts on dune systems was undertaken in the Dune Geomorphology Assessment (Appendix E2 of the Revised Draft EIR Version 1). The desalination plant will not be located in the littoral active zone. In fact the exact location of the desalination plant is not indicated in the Revised Draft EIR. The desalination plant will be situated inland of the proposed coastal buffer zone of 200 m (refer to Response 3) at all three of the potential alternative sites for Nuclear-1.

Comment 10:

10) Protected Areas and Adjacent Land to Proposed Sites

At least one of the proposed sites is adjacent to an area that forms part of the Protected Areas Expansion Strategy. It is also possible that state-owned land adjacent or proximate to the proposed sites may be impacted. These possibilities warrant investigation with requisite consultation with the appropriate parties to be undertaken and included in the EIR.

Response 10:

South African National Parks and conservation bodies such as CapeNature have been involved as key stakeholders (or interested and affected parties) in the EIA from the start of the Nuclear-1 EIA process.

Comment 11:

11) Coastal and Marine Access

As mentioned above, the owner-controlled zone poses the risk of hindering or altogether prohibiting access to coastal public property (CPP) at each of the sites. This owner controlled zone also runs the risk of placing restrictions into the sea if implemented. As a result, section 18 of the ICM Act referring

to coastal access needs to be taken into account by the EAP, with a strategy to ensure reasonable access to CPP by member of the public where required and/or necessary. Additional to this the stated uncertainty over whether there will be a 1 or 2 km marine exclusion zone and its implications needs to be addressed.

Response 11:

Your comment is noted.

The principle of maintaining public access to the “coastal public property”, which is recognised under the NEM: ICMA is acknowledged. Where possible, Eskom will minimise the intrusion on the right of the public to access to this area. As is the case with the Koeberg Nuclear Power Station, the nature reserve that is proposed to be established around Nuclear-1 will be accessible to the public. Furthermore, Eskom proposes to have permit-based access to the coastal public property lying within the safety exclusion zone.

Unfortunately the width of the marine exclusion zone is not definite at this stage, as it will be dependent on the findings of an investigation by the National Intelligence Agency, to be undertaken in terms of the National Key Points Act, 1980.

Comment 12:

12) Structures below the High-Water Mark (HWM)

There are a number of concerns of the construction and excavation activities that are planned to take place as part of the power station and its associated infrastructure, specifically the excavation of the seabed for the placement of intake and outfall pipelines, the desalination plant and any security structures that may be built as a result. Therefore, the EAP must be aware of the requirements and stipulations of sections 7-15 of the ICM Act, as well as the Sea Shore Act with regards to any potential leases below the HWM.

Response 12:

Your comment is noted. Eskom will have to apply for the appropriate authorisations required by the NEM: ICMA for any construction below the high-water mark.

Comment 13:

13) Climate Change Considerations

Although sea-level rise projections were taken into account in the EIR, a number of additional climate change-related impacts must also be considered. These include Tsunami (and meteo Tsunami) contingency plans in addition to specialist studies showing vulnerability. It is therefore recommended that further considerations of climate change be included in the EIR including safety zone, disaster management planning and evacuation areas, coastal vulnerability indices, setback lines and hazard zone demarcations.

Response 13:

Tsunami and meteo-tsunami events have been considered in the Coastal Engineering Reports in Appendix E16 of the Revised Draft EIR (Version 1 and 2).

Comment 14:

14) Marine ecology considerations

The marine ecology specialist report examined both biodiversity and likely impacts on species and ecosystems largely oceanographic modelling outputs, in particularly peak sea temperatures during the operational phase, and sedimentation in the marine environment (at Thyspunt). Here it was noted that

relatively few marine ecology problem issues had been identified at the sites apart from potential impacts on the squid spawning at Thyspunt and abalone spawning at Bantamsklip.

As the EIA specialist reports need to consider all marine biodiversity and not just major commercial resources, this was taken further by questions being posed to the marine ecology specialist Prof Griffiths on 1 August 2011. This resulted in confirmation that the main marine ecological concern at Thyspunt was squid (which was why the warm water discharge was proposed to be discharged inshore) whilst in contrast at Bantamsklip the warm water discharge point would have to be offshore to avoid impacting one of the remaining abalone breeding centres. This example of an interactive approach between the specialist studies and infrastructure planning is appropriate and welcomed but residual impacts should continue to be addressed. In addition I am informed that further reports/workshops which include ways of further reducing the potential impact of sedimentation on squid spawning were still awaited (and thus were not included in documentation made available). Issues and recommendations raised should be addressed as part of the EIA.

Regarding marine biodiversity (other than the key commercial species noted above) it was also confirmed by Prof Griffiths that a field survey of the intertidal resources and appropriate literature studies of the inshore benthic resources had been undertaken. Due to the geographic range of the species found in the area it was concluded that no species would be particularly vulnerable to raised temperatures at Thyspunt. The specialist noted he regarded these findings as robust. Nevertheless it should be emphasised that appropriate comprehensive monitoring of marine biota should be undertaken on an ongoing basis during construction and operation, to check on whether impacts on species remain in line with anticipations, and also that any new species occurrence/settlement in the environmentally impacted areas (mainly close to the outfall) do not pose a danger to surrounding marine and coastal areas. This comment would apply to all sites.

Response 14:

Your comment is noted.

On-going monitoring of various environmental variables, including variables in the marine environment, is recommended for the pre-construction, construction and operational phases. Such monitoring is essential to confirm the impact predictions, to ensure early warning of potential unintended impacts and to ensure that the Environmental Management Plan for construction can be continually updated to minimise and avoid environmental impacts.

Comment 15:

15) Socio-economic costs and benefits – as presented by the EAP

Lastly, the factors which have the highest weighting in the EIA are seismic and socio-economic issues, and such findings (and weightings) in these categories were pivotal in Thyspunt being the preferred site. Although the seismic arguments were clear in the report and in the consultant's presentation on 28 July 2011, there was no clarity in the presentation about the way various socio-economic issues had been scored or had contributed to the recommended site, even after questions. In this regard all parties present at the meeting (not considering the EAP) concurred about this matter and strongly put it to the EAP that the socio-economic section of the report needed to be redone in such a manner so that the findings would be clear - to the Department and others.

Response 15:

Please refer to response 8 above.

Comment 16:

I trust that these comments and recommendations are in order and I look forward to your response. Should you have any queries please do not hesitate to contact the office of the Chief Director of Integrated Coastal Management, Dr Razeena Omar, for any aspects that require detail and/or clarification.

Response 16:

Your comment is noted. Your organisation is on the stakeholder database for the Nuclear-1 EIA process and as such will be kept informed of any further developments in the EIA.

Yours faithfully
for GIBB (Pty) Ltd

A handwritten signature in black ink, appearing to be a stylized 'S' or 'J' followed by a flourish.

The Nuclear-1 EIA Team