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Attention: St Francis Bay Residents' Association, on behalf of the Thyspunt Alliance

Dear Sir

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

Your correspondence to Ms. Bongzi Shinga of Acer (Africa) entitled "Comments on Draft Environmental Impact Report (DEIR): Nuclear 1 Thyspunt" refers.

Arcus GIBB acknowledges receipt of the above-mentioned letter. 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)

In this documents FOSTER provides comment on the DEIR regarding the location of Nuclear 1 at the Thyspunt site in the Eastern Cape. FOSTER is a partner of the Thyspunt Alliance, a coalition of community-based organizations that are opposing the location of the facility at Thyspunt. After due consideration FOSTER concludes that the establishment of this infrastructure at this site has several fatal flaws. Given the biological uniqueness of the site, the quality and quantity of ecosystem services that it provides, and its dynamic and unpredictable physical characteristics, FOSTER recommends that the site and adjacent areas of the bypass dune landscape are proclaimed a conservation area and managed accordingly. Our argument is elaborated below.

Response (1)

Your comment is noted.

Your Comment (2)

Unpredictable dynamics in a soft landscape

As pointed out in the comments by Prof Fred Ellery of Rhodes University, the dynamics of the dunefield and associated wetlands are not sufficiently well understood to mitigate against catastrophic events. Specialist reports APP E 12 (Freshwater Ecology), APP E 2 (Dune Geomorphology) and APP E 7 (Geohydrology) agree that the dynamics of the system are imperfectly understood. Specifically, experts are unable to predict with reasonable certainty



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- the impact that the excavation required for infrastructure will have on draw down of groundwater and associated negative impacts on sensitive wetlands, particularly the Langefontein system;
- the impact of locating infrastructure in the mobile dunefield on dune and wetland dynamics;
- the impact of flooding events (like the one in Nov 2007) on the infrastructure (See Figs 1 and 2).

Moreover, specialists have failed to consider rigorously the likely impacts of climate change on the dynamics of the system. Rising sea levels and increasing wind and wave regimes are likely to re-supply re-energize the by-pass dunefield. Moreover, a higher frequency of flooding events, as predicted by climate change models, will undoubtedly exacerbate the catastrophic dynamics described in Prof Ellery's report.

In summary, the specialist reports fail to provide an adequate assessment of the risks to both infrastructure and to nature of locating potentially lethal facility in a soft landscapes characterized by complex dynamics of wind, sand and water. This is a fatal flaw. The facility must be located in a less risk-prone environment.

Response (2)

Response from the appointed Wetland Specialist:

Your comments accord with those of the freshwater ecosystems study, which concludes that, until higher confidence can be attached to predicting the outcomes of the proposed development, and the impact of the construction and operational phase drawdown in particular, the development should not proceed, in terms of the precautionary principle, and hence that the significance of the development should be regarded as high, and negative. However, additional studies were recommended to try to improve confidence in key areas of uncertainty, and detailed surface / groundwater monitoring programmes are currently under way, to this effect. The results of these studies will be assessed objectively, and used to determine the extent to which the proposed development will indeed threaten the wetland ecosystems associated with the site. The project of further assessment of the wetland systems in Thyspunt site commenced on 19 Jan 2010 and is due for completion on 18 Jan 2011. This 12 month period was aimed at performing the monitoring of the system for the four seasons of the year. Quarterly reports have been submitted, and there is currently no fact leading to the site disqualification (or presenting fatal flaws). In essence the investigations are unearthing the dune systems interrelationships. It is envisaged that where there are concerns there will be engineering mitigating actions put in place on commencement of construction.

With regard to the impact of locating infrastructure in the dunefield, the freshwater ecosystems report recommends against any permanent infrastructure in the dunefield, other than the transmission lines, the impact of which requires mitigation but, assuming that the structures are technically feasible, should not disrupt surface/groundwater interactions. This aspect is being investigated in the ongoing surface / groundwater studies at Thyspunt. No roads of any type are recommended within the dune areas.

Response from the appointed Dune Ecology and Botany Specialist:

The botanical report recommends strongly against ANY permanent infrastructure in the mobile dunes, notably the south-north road linking the Nuclear Power Station with the HV Yard.

The report also cautions against placing of the Nuclear Power Station too close to the Langefontein wetland – recognised as endemic and of extreme rarity due to both its endemism as well as its ecological composition and unique functioning – as well the rare and endemic coastal seeps. The botanical report also gives low confidence to mitigation measures aimed at reducing or preferably eliminating likely impacts on ground water levels; any unnatural draw down of ground water in the vicinity of the NPS is likely to have a severe and negative impact on maintenance of both the

Langefontein and the coastal seeps. In this the comments of the wetland specialist are strongly supported.

In terms of rise in sea level, a 200 m corridor has been proposed (and accepted by Eskom) for any planned Nuclear Power Stations at the coast, and this will cater for any rise in sea level in the medium to long term. Naturally the findings of Prof. Fred Ellery will need to be reviewed to establish what corridor width/coastal setback might be sufficient, but certainly 200 m should cater for the scenario proposed by Prestedge et al, 2009.

Response from the appointed Dune Geomorphology Specialist:

An addendum to the Dune Geomorphology study was commissioned by GIBB to investigate the potential for debris flows. A relevant extract from this addendum is as follows:

“The following observations are pertinent to the deposits in the Sand River found by Fred Ellery:

- There are no slopes in the area that are steep enough to initiate debris flows.
- The Sand River slopes at 0.67°, too shallow to sustain debris flows.
- Koos Reddering has studied the photographs of the deposits using image enhancement, and has identified features that could be cross-bedding and soft-sediment deformation, although these are vague, and cannot be positively identified without a field visit.
- Jenny Burkinshaw, Izak Rust, Pete Illgner and Werner Illenberger have never seen any debris flows or debris flow deposits in many field visits to the area, including some visits made shortly after flood events of the Sand River.
- Koos Reddering has mapped the geology of the area in detail and has never seen any debris flow deposits.

The opinion of the above specialist¹ is that the supposed debris flow deposits are river flood deposits of sand, some mud, a few pebbles, and some plant debris, that were entrained and later deposited by the Sand River when in flood.

It is concluded that there are no debris flows or debris flow deposits in the Sand River. There are no other environmental conditions in the Cape St. Francis area that are conducive to the formation of debris flows. Thus debris flows cannot pose a threat to a possible Nuclear Power Station and its associated infrastructure at the Thyspunt site.”

Your Comment (3)

Globally unique biodiversity and ecosystems

The Freshwater Ecology report (APP E 12) maintains that the site forms part of a globally unique ecosystem with irreplaceable freshwater biodiversity. The Dune Geomorphology report (APP E 2) similarly emphasizes the unique features of the mobile dune systems. Both these reports, as well as the Vertebrate Faunal Assessment report (APP E 13) state 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 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. Yet there is no guarantee that this biodiversity will be safeguarded, even with stringent mitigation (note that the Freshwater Ecology report invokes conservation of the larger system as mitigation; as pointed out below, this is erroneous.

¹ Koos Reddering

Response (3)

The Draft EIR has recommended that no development must take place within the Oyster Bay Mobile Dunefield. This is the reason why the proposed Northern Access Road, which was favoured by Eskom, has been rejected as an alternative. The wetland systems on the site are similarly recognised as important and valuable systems, and infrastructure (e.g. access roads) has been optimised by the specialists to ensure alignments and placements that cause the lowest possible levels of impact. The proposed placement of infrastructure on the site avoids the wetlands, with the only potential remaining impact being the possible impact of the drawdown of water on the wetlands.

Response from the appointed Wetland Specialist: Your comments accord with those of the freshwater ecosystems study, which concludes that, until higher confidence can be attached to predicting the outcomes of the proposed development, and the impact of the construction and operational phase drawdown in particular, the development should not proceed, in terms of the precautionary principle, and hence that the significance of the development should be regarded as high, and negative. However, additional studies were recommended to try to improve confidence in key areas of uncertainty, and detailed surface / groundwater monitoring programmes are currently under way, to this effect. The results of these studies will be assessed objectively, and used to determine the extent to which the proposed development will indeed threaten the wetland ecosystems associated with the site.

Response from the appointed Dune Ecology and Botany Specialist: Any development in this area must see to the long term protection and sustainability of the Langefontein and coastal seeps, as well as the mobile transverse dune system, unique in South Africa and indeed the world. There is no present guarantee of such protection elsewhere in the area and the botanical report deals with this in some detail. There is presently no guarantee the dune will be safeguarded. Current development expansion onto the dune at both ends (Oyster Bay and Cape St. Francis), not to mention the St. Francis Links golf estate, indicates development is likely to continue unchecked in the foreseeable future. Present losses to development on the dune are of the order of 19 % (2944 ha). A NPS at Thyspunt could play a major and positive role by protecting a significant portion of the system (immediate site and up to 2 km development exclusion zone).

Your Comment (4)

Ecosystem services

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 none of the reports attempted to quantify the value of the site's 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 (see Geohydrological Assessment APP E 7); this could be sustainably used to supplement the region's water supply from the Kromme dams). Other services ignored include the existence value of an incredible archaeological record comprising evidence of human occupation from Early Stone Age (1.5 My) to the post-industrial age (few places in the world can boast this). Eco- and cultural tourism are other services that have been ignored. It may well be that the value to humankind of safeguarding the bypass dunes and associated wetlands may be greater than the benefits of establishing the facility on this site. The analysis needs to be done by a competent consultant.

Response (4)

Response from the appointed Wetland Specialist: From a freshwater ecosystem perspective, the ongoing impacts of water abstraction to supply adjacent developments would also require detailed assessment, to ensure that adjacent wetland ecosystems were not affected.

Response from the appointed Dune Ecology and Botany Specialist: Conservation of the system linked to a Nuclear Power Station would protect ecosystem services to a larger or lesser degree, particularly as it is recommended in the botanical report that in the mobile system no fixed development should take place

Your Comment (5)

Establishing a protected area as mitigation

Several of the biological reports – but most notably the Freshwater Ecology one (APP E 12) – recommend 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 (call 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.

Response (5)

Response from the appointed Wetland Specialist: Please note that the Freshwater Ecology report does not suggest that the incorporation of additional duneslack and other wetland areas into a managed conservation area is in any way a mitigation measure – the report notes that, even after essential mitigation measures have been imposed, there would still be residual impacts to wetland systems, and thus recommends a “**compensation offset**” (Section 5.4.9) – namely, the conservation and ongoing management of an extensive area of duneslack and valley bottom wetland (including areas of the latter for which development rights have already been approved).

With regard to the issue of a negative impact of the development on important wetlands – please note that the freshwater ecosystems report has recommended that **no development** should take place at the Thyspunt site, on the basis of existing information. However, should additional data show conclusively that the development will not impact in any way on the Langefonteinvelei or the duneslack wetlands, and that the impact on the coastal seeps can be minimized, then this assessment should be adjusted to a more positive rating.

Response from the appointed Dune Ecology and Botany Specialist: A conservation area has been dealt with above, but there is agreement with the above statement by the wetland specialist that a NPS would provide a **positive impact** and a **biodiversity offset** in that no further development would occur within a 2 km exclusion zone around the Nuclear Power Station. This could form the anchor for a larger protected area (possibly for inclusion in the Baviaanskloof Mega Reserve as has been proposed by FOSTER).

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



Figure 1. The Oyster Bay headland bypass dune, looking west from the edge of St. Francis Links Golf Estate. This massive system is unique in South Africa. It is also highly dynamic in a way that is not fully understood by specialists.



Figure 2. Dune slack wetlands in the Oyster Bay dunefield. The Thyspunt site includes seven wetlands, including several of utmost conservation significance. The Freshwater Ecology Report (APP E 12) states that the impacts of establishment of the proposed facility on the site's wetlands would be of "very high negative significance" without "implementation of mitigation measures". However, these measures will be difficult to implement and costly. Furthermore, several reports acknowledge that the dune-freshwater system is not sufficiently well understood and requires further investigation.

Response from the appointed Dune Ecology and Botany Specialist:

The dune slack wetlands would not be directly impacted by the development particularly as the proposed Northern Access Road has now been withdrawn as an option.



Figure 3. Damage to infrastructure associated with the transport of sand and water from the Easter Valley Bottom wetland after the high rainfall event in November 2007.