

PROCESS REVIEW OF THE DRAFT ENVIRONMENTAL IMPACT ASSESSMENT FOR ESKOM'S NUCLEAR -1 PROJECT

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1 TERMS OR REFERENCE

This review is prepared by Mark Wood and Sean O'Beirne at the request of Eskom. It is principally a process review and is not intended as a means of verifying the scientific accuracy or completeness of the specialist studies that were prepared for the investigation. Specialist reviews have been undertaken for that purpose.

The review broadly follows the DEAT (2004) review guidelines. Specific requirements from Eskom included verification of the EIA's compliance with the following:

- EIA process requirements as stipulated in the EIA regulations (Government Notice No. R 385 of 2006);
- EIA process requirements as stipulated in the National Environmental Management Act, 1998 (Act No. 107 of 2010);
- Relevant government guidelines for Scoping and EIA processes and public participation process related to the above-mentioned legislation;
- Requirements of the DEA's approval of the Nuclear-1 Final Scoping Report, dated 19 November 2008;
- Requirements of the Final Plan of Study for EIA, dated September 2009 and accepted by the DEA;
- Requirements of the DEA's approval of the Revised Plan of Study for EIA, dated 19 January 2010; and
- Generally accepted best practice for environmental impact assessment processes.

Various minutes of authority meetings and comments by the DEA and DEA&DP are also referred in the terms of reference as a basis for the review.

Specific focus areas specified in the terms of reference for the review include the methodology used in the EIA with respect to:

- The public participation processes;
- The identification of reasonable and feasible alternatives (refer to Chapter 5 of the DEIR);
- The reliance on information from the Nuclear Site Investigation Programme (NSIP) to identify site alternatives;
- The scoping out of Coega Industrial Development Zone as a reasonable and feasible site during the Scoping phase (Refer to comments received from Coega Development Corporation in the Issues and Response Reports);

- The methodology that has been employed to assess impacts and identify the preferred site alternative in Chapter 9 of the Draft EIR;
- Independence of the Environmental Assessment Practitioner (EAP);
- Whether the conclusions of the Draft EIR are objectively justifiable and reasonable in light of the information that has been presented.

2 DRAFT EIR PROCESS REVIEW

For the purposes of this review, we will distinguish between public participation process issues (such as ‘I was not informed’, ‘I did not have a long enough time to comment’, ‘the documents were not in my language of choice’, ‘the documents were unclear’, ‘my comments were not reflected accurately’) and EIA process issues (such as ‘the responses to my questions have been inadequate’, ‘the documents are misleading’, ‘Eskom’s wishes are given too much weight’, ‘the consultants have ignored key issues’, ‘realistic alternatives were excluded’). The former issues are considered in Section 2.1 while the latter are considered in Sections 2.2 and 2.3.

2.1 Public Participation

DEAT Review Guideline

‘Has the process resulted in:

- *Key actors being involved (free and informed public participation)?*
- *Priority issues and relevant impacts identified?*
- *Reasonable alternatives established?*
- *Appropriate Terms of Reference prepared?’*

Documents Reviewed:

Final Scoping Report	Chapter 9
Draft EIA	Chapter 7
Draft EIA Appendix D	Issues and Response Report for Scoping and EIA phases of the project
Correspondence	Between GIBB, DEA and DEA&DP

Table 1 provides a summary of the Public Participation Process that was followed, set against recognized public participation objectives. In Section 2.1.1, exceptions to compliance with this process are discussed, based on objections received from stakeholders.

TABLE 1: Adequacy of public participation conducted for the project

PP Objective	Review of Nuclear 1 EIA Compliance
Ensure all relevant stakeholders have been identified and invited to engage in the scoping process	<ul style="list-style-type: none"> • Identification of stakeholders through initial Eskom stakeholder lists for the PBMR process (started out with 3 000 stakeholders) • Liaison with district and local municipalities, ward councillors and community leaders within the three affected provinces • Advertising in national, regional and local publications (25 newspapers) in three languages • Registration process via a registration sheet accompanying a Background Information Document • Invitation to stakeholders to identify additional stakeholders • Distribution of BIDs to all registered stakeholders and to 36 public libraries / other public venues in the 3 affected provinces • Direct invitation to all registered stakeholders to participate in public meetings (approximately 7 000 registered stakeholders in the latter part of the Scoping Phase) • Posting of invitation to participate, BID, registration and comment sheet on the Eskom web site (was BID sent to individual stakeholders?) • Ongoing updating of stakeholders on an electronic database throughout the EIA process • Effort made to identify communities living in the project impacted areas
Raise awareness,	<ul style="list-style-type: none"> • Combined total of 50 meetings held during scoping over a 9-month period,

PP Objective	Review of Nuclear 1 EIA Compliance
educate and increase understanding of stakeholders about the proposed project	<p>attended by over 1700 stakeholders. Meetings included public meetings, key stakeholder workshops, focus group meetings, public open days and key stakeholder and authority feedback meetings</p> <ul style="list-style-type: none"> • Format of meetings designed to encourage comment and discussion. Client technical representatives present at all key meetings • Follow up one-on-one meetings between stakeholders and EIA team members provided further means of understanding issues. All issues raised in ad hoc meetings were fed back to the Public Participation team. • Simple explanatory graphics and presentations used at meetings to enhance understanding of the project • Efforts made to capacitate people to understand difficult technical issues and to provide assistance to people for whom presentations were not in their mother tongue (English, Afrikaans and IsiXhosa speaking team members were available to assist with language difficulties, as required) • Parallel Eskom public process to capacitate stakeholders to understand the nuclear process
Create open channels of communication between stakeholders and the project team	<ul style="list-style-type: none"> • Stakeholders encouraged to interact with all members of the project team. • Stakeholder involvement not limited to statutory defined periods. Comment on the project was accepted at any time during the EIA process. • Effort made to meet with stakeholders outside of scheduled meetings and at times convenient for them. • PP consultants made an effort to maintain open and ongoing channels of communication.
Provide opportunities for stakeholders to identify issues of concern and suggestions for enhancing potential benefits and to prevent or mitigated impacts	<ul style="list-style-type: none"> • Opportunities created including public meetings, workshops, focus group meetings, open houses, as well as open invitation to comment or raise issues in writing, by email or over the telephone • Comment periods complied with DEA guidelines with some exceptions during Scoping which were rectified by extending the comments period for the Draft Scoping Report stakeholders with more time • Interactions with key stakeholders continued well beyond the stipulated time frames for comment on documents. Comments then included and, where necessary, forwarded to the specialists for attention
Provide opportunities for underprivileged groups to participate	<ul style="list-style-type: none"> • Effort made to identify and communicate with potentially affected people in underprivileged communities • Many meetings held in underprivileged communities in order to ease transport burden for these people • Translation facilities available at meetings for people who needed it
Accurately document all opinions, concerns and queries raised regarding the project and provide a complete and readable record of meetings held as a part of the process	<ul style="list-style-type: none"> • All issues and suggestions recorded • Clear documentation of issues • Written stakeholder comment documented verbatim in order to minimize risk of misinterpretation • Responses provided to all issues raised • All meetings minuted • From Final Scoping Report onward, stakeholders who provided extensive comment responded to in person and comment also included in IRR. Other stakeholder issues and study team responses included in the IRR • Consultants maintained a courteous stance notwithstanding accusations from some stakeholders and frequent reference to issues outside of the project scope of work • Responses provided in the IRR, answering issues raised • Records kept of all communication, including meetings, workshops, open houses, written correspondence and telephone conversations.
Ensure the identification of significant issues related to the project	<ul style="list-style-type: none"> • IRR issues initially divided into key groups in order to classify and prioritise them. Later classification by respondent rather than by category on request of DEA • Comment used to inform the specialist studies • Several specialist studies influenced by stakeholder comment received (eg: addition of tourism, economic and land use specialist studies)

2.1.1 Specific Objections raised by Stakeholders about EIA Process regarding Public Participation

The following highlights some of the key issues raised by stakeholders about the public participation for the EIA. We have not attempted to classify all issues, but have focused on those that we consider to be representative of the main objections. We have also focused mainly on the public comments received by the consultants during the review period of the Draft EIA since much of this encompasses stakeholders' concerns about the whole public participation process.

Issue 1: Incomplete identification of key stakeholders within areas potentially affected by Nuclear-1

In our view, the methods used by GIBB to identify and register stakeholders for the EIA have been a sufficient basis for compliance with NEMA. An initial database was prepared by the consultant. The EIA process was advertised in 25 local, regional and national newspapers. Local authorities and other leading community members were consulted at each of the sites. All identified stakeholders were requested to add other stakeholders to the list – a useful and practical way of ensuring that the participation in the EIA was widened to be as inclusive as possible. By the end of scoping, approximately 7 000 stakeholders were on the database.

Advertising for the project was not limited to initial notification only, but also the availability of the main documents for public review and the date and venue of public meetings, which provided further opportunity for anyone who may not have heard of the project to get involved. In Sea Vista, which is one of the closest communities to the preferred site of Nuclear-1, and from where a number of complaints about the public participation stem, the consultants announced meetings in a number of other ways including the use of a loud hailer on a vehicle, driving through the community. This method provided a further opportunity for residents in this area, who were not already registered and consequently directly contacted by the project team regarding available documents and meetings, to register and become involved.

Concerning the objection that more landowners and land occupiers around the proposed nuclear sites should have been identified and directly notified about the EIA; it is not a legal requirement for the EIA team to inform landowners personally who are more than 100m away from the project. Good judgment needs to be used to decide the distance to which it would be reasonable to identify and contact people directly in order to invite their participation. The larger and more potentially controversial the project, the more care needs to be taken to ensure the opportunity to participate for those potentially affected. In our view, best practice in the case of a nuclear power station would be a considerably wider radius than the legal minimum, perhaps determined by the land use restriction zones set out for emergency planning purposes. Gibb indicates that the Emergency Planning Zones for a modern nuclear power station are likely to be an 800m 'Protective Action Zone' where all development is prohibited, and a 3 km 'Urgent Protection Zone', where specific requirements apply concerning emergency evacuation (Draft EIR, Section 3.19.2). Directly contacting all land occupiers within 3 km of the plant would, in our view, constitute a best practice approach.

This was not formally done in the public participation for the EIA. It is understood that a number of landowners outside of the legal minimum distance were consulted, but that no zone of direct influence or clearly defined method to determine requirements for direct contact with stakeholders was established. While not legally required such an approach would have been more rigorous and would have minimized the risk of objections about public participation from people living close to the site.

Issue 2: Inadequate consultation with the South African Squid Management Industry Association (SASMIA) (raised by Thyspunt Alliance, Dawson Edwards & Associates, attorneys responding on behalf of SASMIA, various I&APs in the greater St Francis Bay area)

SASMIA is one of the more important stakeholders potentially affected by Nuclear-1. While comment was submitted to the consultants during the Scoping, and SASMIA is a registered interested and affected party, the organization alleges that it received no response and was not notified of the availability of the Draft EIA or directly communicated with in any way.

Presupposing that the information set out in their reply is accurate, ACER's Draft response to this allegation shows that these allegations are false, and that SASMIA has been properly consulted throughout the EIA process. Whether or not the investigations which have been done by the study team concerning the project's effect on squid are adequate are beyond the remit of this review, but it is noted, from the point of view of due process, that the consultants responded to the objections, brought the relevant study team specialist and SASMIA together for the purposes of discussing their issues, and are now in the process of revising the specialist study to take into account the issues raised.

Issue 3: Registered stakeholder comment omitted from the IRR

From a review of the Scoping and EIA IRR's we have noted that comment received from Mr Krug was not logged in the IRR or responded to directly. It is understood that there are a few other stakeholder to whom this applies. While some of these comments are repeated by other stakeholders and are therefore not new, it is a legal requirement that all stakeholder comments must be acknowledged, indicating how their comments will be responded to (DEA&DP Guideline on Public Participation, Sept. 2007, Section 7.3¹).

We recommend that GIBB corrects this omission in the IRR for the second Draft of the EIA and notifies the stakeholders whose comments were omitted of the corrections.

Issue 4: Incomplete EIA documentation (raised by Thyspunt Alliance)

This issue concerns missing set of maps in the Transport Specialist Study in all hard copies of the EIA and the absence of the Social Impact Specialist Study in the hard copy of documents delivered to the St Francis Bay Municipality.

Stakeholders objected to this, arguing that the omission prevented an understanding of the social impact of the project and the traffic management proposals for the Nuclear Power Station.

It is understood that for this and other reasons, a further extension of the Draft EIA comments period was granted, from 31 May 2010 to 30 June 2010, making the total commenting period 116 days. Once notified of the omissions, Gibb arranged for the missing documents to be delivered to the St Francis Bay Municipality. An extra copy of the full document set was also delivered. The correction of these omissions appears to us to have been reasonable, and, together with the extension of the comments period, should ensure that stakeholders have the opportunity to review and comment on all the documents.

Issue 5: Late receipt of meeting minutes (raised by various I&APs from the Western Cape such as Earthlife Africa, and from the Eastern Cape such as Thyspunt Alliance and Supertubes Surfing Foundation)

It is reasonable for stakeholders to call for the minutes of any meetings held during the review period for an EIA so as to finalize their comments. Stakeholders who were unable to attend the meeting(s) may also wish to use the minutes as a partial basis for their comment. Good practice suggests that particularly in cases where projects are controversial, meeting minutes should be available well before the closing date for comment.

This was not achieved by the EIA study team. It is understood that the reasons were mainly because of the volume of the minutes that had to be transcribed, the need for sign off of minutes by several parties before they could be released, and the fact that the team decided to answer questions that had been posed at the meetings as a part of the feedback with the minutes (pers. comm. Ms Bongji Shinga, ACER). In a number of cases, this necessitated the involvement of Eskom technical experts or study team specialists. In some cases, the minutes were delivered to stakeholders as late as 22 July (Cape Town meeting), which is well after the extended closing date for comment.

The objection by the Thyspunt Alliance was also based on the failure of the consultants to meet an agreed date for distribution of the minutes, which only became available on the day of further

¹ The NEMA regulations require that the person conducting public participation must take into account any guideline applicable to public participation.

meetings that had been agreed that included the participation of the specialists. It is arguable that these delays materially affected the opportunity of some stakeholders to comment on the Draft EIA. However, in our opinion, the commitment to revise the Draft EIA, with a further opportunity to comment, should provide any stakeholders who were disadvantaged by the late distribution of minutes with a reasonable opportunity to express their views fully.

Issue 6: Minutes not a true reflection of what was discussed at the meetings. Minutes distributed with additional information “post-meeting notes”. (raised by Kromme Trust, For A Safe Tomorrow, Thyspunt Alliance, St Francis Bay Residents)

Minutes taken at public meetings must provide as accurate a reflection as possible of the main points discussed. In heated public meetings, this is more easily said than done. People shout objections, many people talk at once and participants do not wait for the microphone to identify themselves and can therefore not be identified afterwards. The ability to take accurate minutes is closely related to how orderly the meeting has been.

It is not possible or desirable to record everything that is said in a meeting. This would result in an unintelligible record from most public meetings. The minute taker is therefore responsible for distilling from the discussions what is pertinent and important to record. Naturally, when there is controversy, the two sides may have differing views about what is important. For this reason, the most reasonable procedure is as follows:

- (i) prepare and distribute the draft minutes
- (ii) invite corrections to the minutes and finalize them only after review and inclusion of reasonable changes
- (iii) record the minutes on tape so as to have recourse to what was said in the event of dispute.

Apart from the delays, which have been discussed above, the process followed by the consultants appears to have been sound, with each of the above steps being complied with.

Regarding ‘post meeting notes’ we can see no objection to these if they were requested at the meeting. However, comment on what was said or clarification of the proponents or consultants opinions given at the meeting should, in our view, not be a part of the meeting minutes – they would best be included in the IRR or in a dedicated section in the Revised Draft EIA. This will also facilitate a quicker turnaround of the meeting minutes.

Issue 7: Reduced distribution of the Draft EIA compared with venues determined during scoping and availability of full reports in English only (raised by various I&APs in the greater St Francis Bay area and Thyspunt Alliance, Centre for Environmental Rights as attorneys for the Sea Vista Forum)

It is understood that all registered stakeholders were provided with a copy of the EIA Summary in a choice of three languages (English, Afrikaans, Xhosa). Afrikaans and Xhosa documents were delayed because of translation issues and only became available some weeks after the English versions were delivered to stakeholders. A single hard copy of the full document set in English was provided to St Francis Bay stakeholders, being lodged at the Municipal offices. A second copy was lodged there during the comments period, after the issue had been raised. CD copies were made available to the St Francis Bay Residents Association, as requested in previous meetings. The full document could also be accessed from Eskom’s web site and by requesting a CD from the consultants.

The main reason for reducing the distribution of hard copies of the documents was apparently cost – each document set costs in the order of R16 000 to reproduce. It is noted that the consultants also believed that sufficient opportunity was provided for stakeholders to call for a full hard copy should they require it. Additional CD copies of the reports were provided at each public venue and CD copies were handed out at the Cape St Francis Key Stakeholders Workshop to any stakeholders that wanted one. Additional CDs were sent to all stakeholders requesting a copy. This was in the context of a comments period that was initially 60 days long and finally extended to 117 days, which should have provided ample opportunity for anyone wanting to study the detail to make the necessary arrangements with the consultants to have access to any of the reports which they wanted to review.

Whether or not there is a significant demand for hard copies by members of the Sea Vista and other communities around St Francis Bay is not possible to say from the information available to us. However, given that underprivileged communities are involved, many of whom will not have access to computers or internet, and that Thyspunt is the site recommended by the EIA for Nuclear-1, reducing the number of hard copies to the St Francis Bay area seems unwise and invites criticism of EIA process. It is recommended that GIBB place hard copies of the Revised Draft EA in the same public places around St Francis Bay that were used for the Draft Scoping Report.

Issue 8: Commencing specialist studies prior to approval of the EIA Plan of Study contravenes NEMA procedural requirements (raised by Tesselaarsdal Action Group (TAG), Strandveld Tourism and Conservation Association)

We agree with the response provided by GIBB on this matter. Baseline work to support specialist studies often starts well before the terms of reference for these studies is approved in the EIA. Seasonal data for some studies may require a year's data collection. Since EIA practice is often accused of delaying business, this approach helps to minimize the time frames that are necessary for the EIA. It is acknowledged by authorities and EIA consultants that any changes in the scope of specialist studies that result from the authority review of the Draft Terms of Reference must be included in the investigation. Subject to this requirement being met, starting specialist studies prior to approval of the EIA Plan of Study does not contravene NEMA's procedural requirements.

2.1.2 Conclusions: due process in the public participation for the EIA

We consider the public participation for the project to have been fair and inclusive. While there have been flaws in the process, these do not appear to us to have been deliberate or systemic and in each case of which we are aware, an effort was made to rectify the mistake or omission and to facilitate the reasonable further involvement of the people affected. The willingness of the consultants to entertain comments at any time during the EIA process extended the opportunity for people's involvement well beyond the initially specified commenting periods. The variety of methods that were used to provide people with the opportunity to participate and to assist people to understand the project was appropriate for a project of this scale. Comment was properly logged, categorized and answered in the IRR report, with the few exceptions referred to above. Since receipt of comment on the Draft EIA Plan of Study, comment was divided into two categories, with all comment being logged and responded to in the IRR while lengthy comment also solicited a direct reply to the author(s). Comment in the IRR will be further categorized according to subject, for inclusion in the Revised Draft EIR and will be cross referenced to the report.

On the IAP2 Spectrum of public involvement, the Nuclear-1 process has been *consultative*, as opposed to simply *informative* or, at the other end of the spectrum, *collaborative*. The level of consultation has been appropriate for a public participation process supporting a large EIA and in our opinion complies with the legal requirements set out by the NEMA and appurtenant regulations, as requirements for good practice.

It appears to us that many of the objections to the public participation process have been driven by dissatisfaction with the findings of the EIA and the selection of Thyspunt as a preferred site. It is always tempting for stakeholders, in such cases, to build a case around as many objections as possible. However, we do not believe that on balance, the public participation has prejudiced any party, preventing fair, open and inclusive involvement in the EIA.

2.2 Reasonable Alternatives Established

DEAT Review Guideline

'Has the process resulted in:

- *Reasonable alternatives established?*
- *Appropriate Terms of Reference prepared?'*

The submission for the authorisation of a Nuclear Power Plant on July 2008 consisted of an application to commence with an EIA process for the proposed construction, operation and

decommissioning of a single power plant, referred to as Nuclear-1. During the scoping phase of the EIA, 5 sites were assessed as alternative options. These were based on the work done by Eskom in the Nuclear Site Investigation Programme, which had, over an extended period, evaluated the options for the location of a nuclear plant and made recommendations to Eskom to purchase portions of land on 2 of the sites.

The five sites were:

- | | | |
|-----------------|----------|--------------------------|
| - Duynefontein | W Cape | Part of the Koeberg site |
| - Bantamsklip | W Cape | Land purchased by Eskom |
| - Thyspunt | E Cape L | Land purchased by Eskom |
| - Brazil | N Cape | |
| - Schulpfontein | N Cape | |

The work done to determine these sites was mostly under the auspices of the Environmental Evaluation Unit of UCT (pers. comm. Ms J Ball, GIBB). The EIA provides a synopsis of the approach that was followed. In the Draft Scoping Report, GIBB advised that the Schulpfontein and Brazil sites in the Northern Cape would not be considered further in the EIA phase of the work.

In addition, during the EIA Phase of the study, a proposal was made by the Coega CTZ to site the power station in the Coega CTZ.

The main issues about alternatives that have arisen during the course of the EIA are as follows:

- (i) The exclusion of alternatives to nuclear power from the EIA
- (ii) The exclusion of the Schulpfontein and Brazil sites from detailed analysis in the EIA (DEA&DP and other stakeholders)
- (iii) Objections to the failure of the EIA to review the findings of the Nuclear Site Investigation Programme or 'NSIP', which was the basis for the selection of the 5 nuclear sites under consideration but which was completed 20 years ago (DEA&DP and other stakeholders)
- (iv) The exclusion of the Coega site as a possible alternative (Coega IDZ)
- (v) Eskom's intention to apply for the future use of all three of the sites considered in the EIA phase of the project, as long as none exhibited any fatal flaws. This objection was based on the grounds that under these circumstances, the sites could not be considered to be alternatives and that NEMA's requirements for investigation of alternatives would therefore not be met
- (vi) The absence of material process alternatives in the EIS scope of work (DE&ADP)

These issues are discussed individually below.

2.2.1 The Exclusion of Alternatives to Nuclear Power from the EIA

It is evident that many stakeholders wanted to re-open the nuclear debate, raising issues about nuclear energy compared with other forms of power generation. As is so often the case in projects involving processes or technologies that are controversial, opposing stakeholders aim their comments at perceived weaknesses in the study's point of departure, which is beyond the scope of the consultants to address.

GIBB has correctly not been drawn into a debate about the desirability of nuclear power or the process that led to the approval of the Nuclear Policy by Cabinet. The consultants simply assert that the approved terms of reference of the EIA concerns the investigation of options for a nuclear power station.

2.2.2 Exclusion of Schulpfontein and Brazil sites from the EIA

GIBB supports the exclusion of the Schulpfontein and Brazil sites from the EIA on the grounds that neither would constitute a reasonable or feasible alternative for Nuclear-1 at present, given limited local power demand and the lack of existing electricity transmission corridors associated with the site - resulting in time frames for acquisition that could not meet Eskom's commitments to bring Nuclear-1 on stream. More specifically, GIBB provides the following reasons for excluding the sites:

- They do not provide the same optimal, strategic and cost effective utilisation of existing infrastructure that is associated with the Duynefontein, Bantamsklip and Thyspunt sites, with respect to local integration and exportation of power via existing power corridors;

- They would result in lengthy time delays associated with the authorisation and construction of the new power corridors which will prevent Eskom from providing the power within the required timeframes;
- They would result in unnecessary environmental impacts associated with the construction of new power corridors given that there is existing infrastructure; and
- There are significant cost implications associated with the development of new power corridors.

GIBB concludes, in response to DEA&DP, that on the basis of Eskom's 20 GW Nuclear Transmission Grid Draft Impact Report (2007), which was included as an Appendix to the Scoping Report, the two northern Cape site alternatives are not considered to be feasible and reasonable alternatives for the short and medium term.

The use of environmental arguments as a reason for excluding the Northern Cape sites from the EIA appears thinly motivated. It is possible that the overall cumulative environmental impact of a power station in the Northern Cape (given its location), together with its associated power lines, could be less than that of the power station in the more sensitive localities in the Southern or Eastern Cape, with the shorter power line infrastructure required. It would be impossible to draw reasonable conclusions about this without having done a comparison. We also do not agree with GIBB's argument (stated elsewhere in response to questions concerning cumulative impacts) that the inclusion of power infrastructure as a part of the NSS EIA would make the study too complex to understand. It is the responsibility of the EIA team to synthesize and evaluate complex information. In circumstances where other factors (such as timing) do not make it impossible, it would be better to base the decision about the preferred nuclear site on an understanding of all the key cumulative effects, and not simply those associated with the power station itself.

The main arguments supporting the exclusion of the Northern Cape sites appear to be related to network integration, time delays and costs. These are not environmental arguments and we are not in a position to comment authoritatively on their legitimacy. It would seem that the timely completion of additional generation capacity is a matter of National interest in South Africa, given the problems over the past few years, and that a significant delay in the completion of Nuclear-1 would be considered by Eskom and Government to be unacceptable. If this is the case, then it may be reasonable that the two sites are excluded from the present site selection process, particularly now that Eskom has committed to an application for a single site (rather than a joint application for all three sites), which means that the three sites carried into the full EIA are genuine alternatives.

2.2.3 Failure to review and verify the findings of Eskom's Nuclear Site Investigation Programme ('NSIP') that led to the selection of the five nuclear sites

An important issue for many stakeholders has been GIBB's decision to rely on the findings of Eskom's Nuclear Site Investigation Programme or 'NSIP'. A number of stakeholders argued that this study is dated, being over 20 years old, and should not have been used as the basis for decisions about the siting of a nuclear power station in the absence of a comprehensive review.

This issue has contributed to the difficult public participation for the project. Much of the comment in the IRR is accusatory and it is understood from the public participation consultants that many of the meetings were difficult and, on a number of occasions, hostile (pers. comm. Ms Bongzi Shinga, ACER). While the comment is too extensive to canvass fully within the time frames for this review, the selection of responses that we have read suggest that a significant number of participants do not trust the EIA process that has been followed. A common response is that Eskom and the consultants are railroading the preferred sites through. In particular, the selection of Thyspunt as the preferred site is seen by many respondents as a miscarriage of EIA process – since the findings of the specialist studies showed an apparently clear environmental preference for the Duynefontein site adjacent to Koeberg. Among those who questioned this recommendation were the DEA themselves. This issue is discussed further in Section 2.3.

The issues surrounding the validity of Eskom's NSIP as a basis for informing the EIA may be summarized with reference to the comment by DEA&DP in their response to the Draft EIA:

'The use of Eskom's 1982 Nuclear Site Investigation Programme ("NSIP") was raised as a concern by some I&APs as the information is outdated by 28 years. This is a valid point as environmental considerations have only been more recently defined in terms of fine-scale biodiversity mapping, ecosystem status

updates, environmental conservation measures including legislation, namely the Environmental Conservation Act, 1989 (Act No. 73 of 1989) ("ECA") and the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA") and its specific Environmental Management Acts such as the National Environmental Management Biodiversity Act, 1998 (Act No. 10 of 2004) and many others. There is concern that the NSIP should have been revised and updated to take into account these new factors, not to mention changes in population and urban growth since 1982. There is a concern that given the significant time that has passed since the finalization of the NSIP, and the inevitable changes that have occurred in the coastal landscape of the country, this study might have limited the number of appropriate sites that have been considered for Nuclear-1.'

GIBB makes no clear statement in either the main Scoping Report or the Draft EIA to confirm whether the study team agrees with the findings of the NSIP or whether they have simply accepted the sites as a point of departure. However, in response to comment on the Draft EIA, GIBB states in the IRR (to be published with the Final EIA) that the NSIP **was** reviewed by the consultants and that it was considered to be still valid. In addition, GIBB observes in its response to DEA&DP that the investigation of any new site would require a minimum of 5 years lead time in order to investigate physical constraints (mainly seismic suitability) before a site could be selected for detailed evaluation in an EIA.

In the absence of details about the NSIP studies in the EIA, or of GIBB's review, we cannot verify that the work was credible and unbiased, and that it took into consideration all of the necessary factors that would, today, inform a decision about a nuclear power station. While it is acknowledged that the NSIP was managed by an organization with an impeccable record for transparency and balanced scientific appraisal - the Environmental Evaluation Unit of UCT - value systems and approaches may change over 20 years, scientific understanding develops, new policies and laws are passed relating to environmental matters and so on. In most circumstances, it would not be considered reasonable to rely on recommendations made over 20 years ago to inform any major decision, without a thorough review of the assumptions underpinning the work and the data on which it was based.

It is, therefore, our opinion that the EIA process would have been strengthened by a comprehensive (and publicly available) review of the NSIP. The appropriate time for this would have been at the beginning of the public scoping, as a supplementary document accompanying the BID. The matter could then have been more thoroughly considered during this phase of the study and an informed decision made about the best way to proceed. The end of an EIA is not the time to be debating whether or not the study's point of departure was correct.

The case that can be made in favour of the decision to restrict the EIA to the selected sites at Thyspunt, Bantamsklip and Duynefontein is as follows:

- (i) The NSIP was prepared by an independent and respected academic organization and included consultation with many other authorities, individuals and private organizations.
- (ii) The specialist studies for the EIA have not raised issues that would suggest that any of the three sites are severely flawed, as long as the impacts are mitigated as recommended, thus validating the original judgment made in the NSIP (it is acknowledged that some stakeholders dispute this, but it is nevertheless the conclusion of the EIA)
- (iii) The NSIP was a part of a chain of actions that necessarily occurred over a long period of time, resulting in the purchase of the selected sites by Eskom and followed by extensive seismic evaluation of each site. These are actions that cannot be repeated for new sites without long delays - GIBB estimates that the consequences of considering new sites for Nuclear-1 would be to disrupt the Nuclear Programme by 5 years or more, and this has been verified by the Council for Geoscience, who have been responsible for the seismic assessment of the three sites considered in the study.

As we have observed above, we are not in a position to attach a value to the importance of the third justification, since this is not an environmental matter. We suspect, however, that in the context of justifications (i) and (ii) above, justification (iii) may prove to be a persuasive argument for decision-makers, particularly as Eskom has, in addition, agreed not to pursue a joint application for all three sites and to review the findings of the NSIP as a basis for Nuclear-2.

2.2.4 Exclusion of Coega as a Feasible Site

The issue of Coega as an alternative site for Nuclear-1 was brought up during the scoping phase of the EIA. Several stakeholders raised the issue, but at that time, the Coega Development Corporation (CDC) indicated that there was insufficient land available in Coega's Industrial Development Zone to accommodate Nuclear-1 (*pers. comm.* R Heydenrich, GIBB). CDC were, however, fully supportive of a power station in the Eastern Cape at Thyspunt, as it would provide the security of supply needed to attract large industries (Final Scoping Report IRR, communication from Dr Peter Inman, CDC).

In response to other stakeholders' queries, GIBB provided the reasons included in the NSIP for the exclusion of the Alexandria area as a feasible site for a nuclear power station (none of the Coega development initiatives existed at the time the NSIP was prepared). These were as described in Box 1. Coega itself lies within the 50km exclusion zone from Port Elizabeth that was used by the NSIP and was therefore excluded on these grounds. The decision to develop Coega as a harbour and industrial node changes the conservation significance of any activities that are proposed within the IDZ and any new proposal to consider a nuclear power station within this zone would need to be viewed in this context.

BOX 1: *GIBB response to stakeholder queries about the reasons that Coega was not considered to be a suitable site for a Nuclear Power Station*

Two regions, i.e. the region East of Port Elizabeth in the Alexandria area and an area west of Port Elizabeth between Cape St Francis and the Groot River Mouth, were investigated in the NSIP. Phases 1 and 2 of the investigation consisted of desktop studies only, while Phase 3 comprised the field investigations into the suitability and sensitivity of the regions identified during the earlier phases, and subsequently the sites identified as a result of the regional field studies.

The Alexandria area was omitted from consideration after Phase 3A and 3B investigations, which revealed the following:

- The region consists of sandy beaches with large wind driven mobile dunes behind the shoreline, which comprise the largest mobile dune field in South Africa. The only rocky outcrops are the cliff faces at Cape Padrone and Woody Cape. The shoreline is easily eroded and unsuitable for the siting of a nuclear power station. In addition the engineering problems associated with the natural movement of the dunes would be considerable;
- Only a small stretch of coastline approximately 1 km in length near Springmount would remain after applying the 50 km demographic requirement from Port Elizabeth and the 200 km requirement from the (then) Ciskei;
- A power station would have to be founded on at least 20 to 30 metres of unconsolidated sand. Piled foundations would have to be used for which the seismic design requirements are particularly onerous.

The environmental consultants responsible for the NSIP considered the environmental sensitivity of the portion of coastline around Alexandria to be very high. The Alexandria forest is a unique natural forest and any disturbance would be highly undesirable. The ecology of the dune fields was also considered to be highly sensitive. The combined high sensitivity and low suitability led to the area being eliminated as a possible site for a future nuclear power station.

Additionally, a site at Coega was not considered since at the time of the NSIP, the necessary safety buffer between a nuclear power station and the nearest urban population was taken to be 20 kms. The distance between Coega and the outskirts of Port Elizabeth is less than this.

During the EIA phase of the current EIA, CDC indicated to GIBB and Eskom that sufficient space is available for a nuclear power station at Coega. It is understood that in subsequent discussions involving Eskom, Gibb and the Coega IDC, it has been agreed that Coega cannot reasonably be considered at this stage for Nuclear-1, due to the delays associated with the verification of the seismic suitability of the site – a process that takes at least 5 years. Coega may be considered as a possible site for Nuclear-2. (*pers. comm.* Ms J Ball, GIBB).

In our opinion, the proposal to site a nuclear plant in the Coega IDZ neatly encapsulates the issues surrounding the dating of information in the NSIP discussed in Section 2.2.3 above. The establishment of a port at Coega and the proclamation of the Coega IDZ changes the conservation perspectives within the area and creates an opportunity for re-evaluation of options for nuclear power. The improved safety characteristics of the third generation nuclear plants also dramatically reduces the buffer zones that are required, which makes sites such as Coega, which are closer to urban centres, available for consideration.

However, taking into consideration the delay to the nuclear programme, and the other arguments discussed in Section 2.2.3, it may be reasonable that Coega is not considered as an option for Nuclear-1, but is included instead as an alternative when the NSIP is reviewed as a basis for Nuclear-2. As indicated above, the impact of delays to Eskom's nuclear programme are not environmental considerations and the weight given to them as reasons to exclude the site are not within the remit of this review.

2.3 EIA Findings

2.3.1 Is there sufficient scientifically based information in the EIR to inform a recommendation about the project?

In responding to this question it must be re-emphasised that we have not considered the individual specialist studies which have been reviewed by others. As such, our review is based only on the information presented in the EIR. It is our opinion that the technical content of the EIR is broadly adequate to make a recommendation about the project. The various specialist areas that have been assessed in the EIR appear to have been supported by rigorous and detailed scientific methods. There were some 25 specialist reports prepared for the EIA, each of which was independently peer reviewed. Where information was limited or there was uncertainty then this was highlighted in the EIR. Regardless of the scale and nature of a project there will always be elements of uncertainty in any EIA. It is not incumbent on the EIA practitioner to resolve all the uncertainty but simply to highlight that uncertainty and how it may affect decision-making.

With the above as background our review focuses on how the findings of the specialist assessments have been structured and integrated in the EIR. Our view is that the presentation of the assessment creates a number of difficulties in making a recommendation about the project. We believe that the EIR is information rich, containing as it does detailed assessments of the potential impacts of the proposed Nuclear Power Station (NPS) on 3 separate sites in considerable detail. The EIR must be structured and populated in such a way that the information presented assists rather than hinders effective decision-making. The discussion presented below must be seen in this context.

Description of the existing environment

The existing environment (baseline) is weakened by the number of issues that do not appear to have direct relevance to the assessment. There are a number of references made to characteristics of the site which are not referred to again in the EIR and as such it is not clear why these have been detailed in the baseline². The purpose of the baseline should be to highlight key vulnerabilities or sensitivities in the receiving environment and to try and characterise in some way how important those sensitivities are. There are many examples in the EIR where the description of a particular characteristic, while interesting, is left somewhat open-ended. For example:

- The heritage assessment in particular seems unnecessarily detailed. Are there heritage items that may be affected and if so how significant are these heritage items? (viz. would loss or damage be tolerable?);
- Page 8-35 – 'downward trend of NO₂ is interesting' – agreed but of what relevance to the NPS;
- Page 8-36 – 'habitat rarity is also moderate for the proposed footprint' – does this mean that impacts are tolerable or not?
- Page 8-37 – 'transverse dune system is poorly represented in the Western Cape Coast' – does this mean that there can be no further impacts?
- Page 8-44 – 'area appears to be significant in terms of invertebrate density' – does this mean that no further impact is tolerable?

² We use the term 'baseline' for the reasons cited in the text although we fully acknowledge that the regulations call for a description of the existing environment.

- Page 8-50 – SO₂ concentrations of 0.63 and 1.76 µg/m³ – does this imply that the presence of SO₂ is negligible and will not contribute materially in terms of possible cumulative effects;
- Page 8-55 – on the coastal portion of Bantamsklip there are 187 bird species – can these bird species be affected in any way?
- Page 8-58 – ‘the possibility that this species has a limited distribution along the southern Cape Coast must be considered’ – how must this be considered, can there be any kind of further impact on the species?
- Page 8-59 extremely detailed presentation of the ants that occur in the area but again no sense of whether a possible impact is tolerable or not.

In all these cases (and others) the reader is left pondering the ‘so-what’ question. While it is not uncommon for the existing environment to be described rather than assessed in EIA (indeed this is what is required in the regulations) we argue that the baseline should clearly present the vulnerabilities of the affected environment. This is especially important as the NPS EIA contains three sites as possible alternatives for the establishment of the proposed NPS. It is extremely difficult for the reader to weigh-up the information presented in the baseline and to try and distinguish between the sites. This is not to usurp the impact assessment that appears later in the EIR, but simply to make the point that in comparing the three sites the *differences* in potential impacts of the proposed NPS will be directly a function of the characteristics of the receiving environment rather than the environmental and social aspects of the NPS. As such it is essential to develop a strong sense of the distinguishing features of the different sites in presenting the baseline and how important these will be in decision-making. The greater the degree to which the importance or conservation significance of these distinguishing features is presented the easier it will be in the impact assessment chapter to distinguish meaningfully between the three sites.

It is also difficult to make sense of what are presented as ‘sensitive areas’. Are these areas to be avoided, can they be compromised to some extent or what must be made of them? There is for example a bulleted item that states that ‘no areas are of low sensitivity because they are all in relatively natural unspoilt condition’. Again the reader is left pondering whether this means that no development can take place in these areas, whether it will just be a pity if development takes place or whether it matters at all. As long as there is ambiguity readers will draw their own conclusions and this is not helpful to decision-making. Specialists must be prepared to make statements on the conservation or preservation value of the features included in the baseline even if these are no more than qualitative judgements. It is also not clear what is meant by ‘sphere of impact’ (in for example Fig 8.88). This is a seemingly important part of the baseline but it is not clear how the sphere of impact has been derived and thus what it means. If the sphere of influence was clear then this could serve to help distinguish between characteristics of the receiving environment that might influence the decision and those that will not. It is essential that the reader understands for each significant feature in the existing environment, the conservation value, how the proposed project would impact on such features and the resultant significance of those impacts recognising that that continuum is split over two chapters (existing environment and impacts assessment chapters). The easier it is to follow that continuum for any given impact the more credible the assessment.

We argue that the baseline would be helped by a short summary at the end of each site section that highlights the features/characteristics of the site that are likely to be important for decision-making and the conservation value of the same. If the ‘zone of impact’ were better defined this could also be used potentially to assist in the structuring of the information that has been presented. For example, the zone of impact could distinguish between direct loss – viz the construction and plant footprint, a ‘buffer zone’ (power station property), a ‘safety’ zone and so forth. Readers would then be able to better contextualise the features of the existing environment prior to considering the impact assessment chapter. Currently it is necessary to frequently page back to the baseline chapter to try and check what was presented previously.

The Impact Assessment Methodology

The Impact Assessment methodology presented in the EIR appears to be too complicated and possibly confuses some of the principles that should apply in defining significance. The type of significance rating method that is presented in the EIR is based on the concept that risk is function of the consequence of an event multiplied by its probability. This relationship between consequence and probability highlights that risk (or impact significance) must be evaluated in terms of the seriousness of the impact weighted by the probability of that impact occurring. For example

the consequence of an aeroplane crashing on landing at ORTIA is severe and likely to result in multiple fatalities but the probability of it happening is so low that thousands of passengers happily accept that risk on a daily basis.

The *consequence* of a potential impact must be clearly presented using at least some of the rating criteria presented in 7.7.1. For example the consequence of an impact can be characterised by the extent of that impact, its duration, intensity and so forth. In simple terms if the consequence is high and the impact probable then impact significance would be high, but if the impact consequence is high but the impact improbable then the significance cannot be high. In many instances mitigation serves to reduce the *probability* of an impact occurring rather than necessarily the *consequence* of the impact (most notably in the operations of an NPS). Probability should not be used to characterise consequence as presented in the EIR but rather in the manner described above. Very importantly, probability must be defined as the probability of the impact not as the probability of the activities that may result in the impact which, if the activities occur, will by definition always translate into highly probable or definite.

In defining impact consequence there must be consistency across the specialist studies because in many cases this is the one area in the EIA where the significance of impacts in different disciplines can be compared (albeit qualitatively). The rating criteria in 7.7.6 include 'consequence' as a rating criterion but we argue that consequence should be presented as the collective outcome of the rating criteria. The intensity of the impact provides a good starting point and this intensity can then be increased or decreased as a function of the extent, duration, reversibility and so forth of the impact. The term consequence then refers to the impact intensity moderated by the extent, duration etc. In other words an impact may have a high intensity (e.g. loss of important habitat) but the consequence would be a function of that intensity and the scale and duration of the impact. The multiple permutations in Table 7-10 do not appear to uphold these important principles and are too onerous and confusing to be used consistently and thus effectively, in presenting impact significance.

The impact assessment

In the impact assessment chapter the complexity and ambiguity of the significance rating method is evident in the presentation of the impacts and their significance. In addition there are a multitude of impacts listed all of which are summarised in tables. Many of these impacts are duplicated. For example, in Table 9-8 'loss of transverse dunes' is listed as an impact category. The next impact category is 'loss of ecosystem function' but the impact is again 'loss of transverse dunes'. There has been no attempt in the EIR to synthesise or integrate the many impacts listed into fewer and more meaningful impact categories. If there were fewer impact categories then the derivation of the significance ratings for each impact could be carefully described rather than being just listed in a table without supporting arguments. We also contend that presenting impacts as components of how the impacts may manifest detracts from presenting cumulative impacts effectively.

It is also pointless listing impacts that are simply not going to happen. For example, there are a multitude of high significance impacts that reduce to low significance by moving the footprint. We argue that the documents will be more reader-friendly if the recommendations about which areas must be avoided are presented and have these as conditions if the NPS is approved. To list multiple *improbable* impacts as 'high significance' does not aid the decision-maker in recognising the key decision-making issues. In many instances also the significance of these impacts is reduced by mitigation without a clear explanation of how the mitigation might in fact reduce the impact significance. For example, the loss of habitat in Table 9.6 goes from 'high' to 'medium low' because the consequence changes to 'low' but it is not clear how the consequence would change as the impact column indicates 'no mitigation for habitat loss'.

The use of the rating criteria is inconsistent and in some instances very difficult to understand. The loss of species, habitat and ecosystem functioning is presented as local, regional and national – how would this be possible if the extent of impact is no more than the footprint of the site? It seems that the extent has been wrongly interpreted as the 'extent of the significance' rather than the extent of the impact which is the case in point. The reader is also assailed by a plethora of impacts of high significance which simply 'cheapens' the rating process. For example impacts on terrestrial vertebrate fauna at Bantamsklip (Table 9-22) contains: 'Destruction of natural habitats, and populations, resulting from site clearance, laydown areas and infrastructure' and this is given a significance rating of high. If the destruction is brought about by site clearance, laydown areas and

infrastructure how can this impact be national in extent (see comment above)? In addition if the destruction of national habitats extended over an area two or three or ten times larger than the footprint of the NPS, what impact significance would then be ascribed?

In a similar vein, light pollution during the operational phase of the NPS on invertebrate fauna at Thyspunt is ascribed an impact significance of 'high'. How then would the impact of completely stripping the area of vegetation be described in terms of impacts on invertebrate fauna – also high-viz. the same as the impact of the light pollution? Perhaps more importantly, decision-makers must consider how the light pollution would translate into a possible loss of invertebrate fauna and the significance of that loss? That is simply not possible on the basis of how the information is presented in the EIR. Given that there is no significance rating higher than 'high', the reader is left to assume that a rating of 'high' implies an impact that could potentially disqualify the project. Is the reader to understand that the impact of light on invertebrate species could disqualify the project? This is especially puzzling in view of the conclusion that none of the three sites investigated are considered to be unsuitable for the development of the NPS.

The net effect of all of the above is that it is very difficult to determine which impacts are really significant for decision-making and which are not. With the significance rating presented as it is currently none of the sites appear suitable for the development of the NPS yet the conclusion is still drawn that all are suitable. Many of the impact ratings of high significance are not at all convincing for the reasons detailed above and so we argue that the impacts presented in the EIR have been *exaggerated* by the significance rating process that has been used. This is simply not helpful to decision-makers. It must also be acknowledged that if the impact rating process is weak then it is also possible that the significance of an impact may have been understated in some instances, as implied in the letter from the attorneys representing SASMIA.

We recommend, therefore, that the significance rating method be revisited and simplified and then applied consistently, logically and meaningfully to the impacts that have been identified. Where necessary, this will need to be done with the participation of the relevant specialists. At the same time the number of impacts should be reduced dramatically by eliminating duplication, and then synthesising and integrating the impacts into broader scale impact categories. Instead of presenting, for example, the multiple ways in which the NPS project could impact on invertebrates each as a separate impact, it would make more sense to rather present a single impact (e.g. reduction in the population or diversity of invertebrates) as a result of all the effects of the NPS together with the significance of that reduction in population or diversity. It is important to recognise that the rating method does not necessarily allow for a direct comparison between an impact on biodiversity and an impact on human health, it just provides a method of indicating within a given specialist domain what would be considered to be a significant impact and that this will be done applying the same logic to each specialist area.

2.3.2 Is the mitigation defined in the report focused, practical and sufficient to ensure that the post-mitigation impact rankings are achieved?

In general the presentation of mitigation in the report is focused and practical and concentrates principally on the avoidance of certain sensitive areas, which seems appropriate. There are several issues that we feel must be addressed, however, and these are detailed below.

The impact of mitigation in reducing impact significance has been presented crudely in the EIA. This seems to be a function of the weak significance rating scheme, rather than poorly defined mitigation. Using an example cited earlier, the loss of habitat in Table 9.6 changes from high (unmitigated) to medium low (mitigated) in the significance rating because the consequence changes to low but it is not clear how the consequence would change as the impact column indicates 'no mitigation for habitat loss'. If the significance rating is done correctly then whatever mitigation is proposed can be presented to show whether the mitigation will reduce the intensity, duration and/or extent of the impact (consequence) or the probability that the impact will occur. In this manner it will be clear to the reader how the mitigation will reduce the impact and the degree to which the impact will be reduced. In any EIA, impacts that are rated 'high' impact and then then 'low' as a result of mitigation are seldom perceived to be credible assessments Experience shows that where this is the case there is typically one of three problems:

- The significance rating scheme is weak and thus either the unmitigated impacts or the effect of mitigation is exaggerated;

- Activities and impacts are presented that are improbable – viz. if the NPS is situated in the centre of Cape Town the impact will be high but if the NPS is situated outside of the city the impacts will be low; and,
- There is a deliberate attempt to bias the outcome in favour of the development.

We argue that it is the first two bullets that apply in the NPS EIR. Again this highlights the critical need to rework the significance rating scheme for the EIR and the presentation of the impacts if the mitigation is to be credibly presented.

It is also necessary to deal with the comment from DEA&DP that ‘the report is silent, though, on the applicant’s ability to respect these recommendations’. This is an example of the exaggerated and unreasonable demands that are sometimes placed on an EIA. We do not believe that it is incumbent on the EIA practitioner to somehow prove that the applicant will implement the mitigation. The only requirement for the EIA practitioner is to ensure that the recommendations are reasonable and implementable. The authorities must stipulate in their authorization, if indeed they chose to approve the project, conditions that must be implemented for the authorisation to be upheld. The applicant must accept the conditions or, if they cannot or are unwilling to, they must appeal the decision. If the project proceeds, it is up to the authorities to enforce the conditions and to ensure that there is effective punitive action in the event that they are not upheld.

2.3.3 Have cumulative impacts been adequately considered in the report?

There are two broad principles at stake here. The first of these is whether or not the full extent of the development has been adequately presented and assessed (viz. power station and transmission lines and staff village) and the second is whether the combined (cumulative) impacts of all activities in the area have been assessed. We deal only with the former issue as we have not reviewed the individual specialist studies. In our opinion the latter appears to have been satisfactorily addressed, bar the issue of significance rating and presentation of impacts which has already been dealt with extensively in this review.

In terms of the former issue we note the comments of both DEA&DP and DEA in respect of the need to present the ‘big picture’. We also note the response provided by the EIA practitioners that to provide all the information on all the possible transmission line routes would require that multiple scenarios be presented in the EIR which in itself is already very difficult to digest. Our view is that the EIA practitioners must find a way of reducing the complexity so that the decision-making significance of the transmission lines (and other associated infrastructure) is properly presented. It simply has to be recognised that transmission line impacts (for example) could well influence the optimal siting of the NPS. The most important issue is to ensure that the authorities are not forced to approve the transmission lines at a later stage by virtue of the approval of the power station. However, this latter item only becomes important if the authorities are forced to approve the transmission lines in the face of a potentially intolerable impact. In these terms it is not incumbent on the EIA practitioners to present the transmission lines in detail but rather to simply highlight key concerns that could result in such a fatal flaw.

In using the sensitivity of the transmission line routing as one of the reasons for disqualifying the Bantamsklip site, the EIA practitioners have upheld this principle. because of the We contend that in principle at least the practitioners are compelled to do no more than what they have already done, although there are two further issues that should also be addressed. The first of these is whether or not Bantamsklip does in fact remain a viable site for the later possible development of an NPS as indicated in the EIR (given the sensitivity of the transmission line routing and the other issues that lead to the site being excluded). The second is whether enough has been done in the existing EIR to present a compelling case for having adequately assessed the possible fatal flaws in the transmission line routings. We contend that the flexibility in routing a transmission line means that it is highly unlikely that authorities would be compelled to authorise the transmission lines (because they had already authorised the power station) despite being faced with a fatal flaw. The same would apply to the issue of the staff village.

A second important issue is that the applicant must also recognise that there is some risk in this approach. That risk is that the authorities find during the detailed EIA of the transmission lines or the staff village that they simply cannot approve one or both. For this reason, it is critical that the fatal flaw analysis on the transmission lines and the staff village be thorough and meaningful in the interests of both the applicant and the authorities.

2.3.4 Is the selection of Thyspunt as the preferred site a credible and unbiased recommendation?

In responding to this question the first issue that must be noted is the difficulty in clearly differentiating between the characteristics of the different sites as a result of the way that the baseline description is presented. This is further compounded by the myriad of supposed impacts and the large number of these impacts that are deemed to be of high significance. As part of our review the comments made by DEA and DEA&DP on the Draft Environmental Impact Report (and the site selection process in particular) have also been considered. In these two submissions there are important questions raised regarding bias on the part of the practitioners in favour of the applicant. It is necessary for us to deal with the issue of potential bias.

It should be noted that the comments from DEA and DEA&DP appear to suggest that there can only be bias if the assessment favours the applicant. We contend that it must also be true that an assessment can be biased toward those parties that object to a particular development if the potential impacts are not presented in a balanced and fair manner. If independence and objectivity are the hallmarks of good environmental assessment then those requirements must apply both ways. Within this debate it must also be accepted that the nature of a large scale power station is that the negative impacts tend to occur at the point of generation while the major benefits (access to a sustained, affordable supply of electricity) occur elsewhere. It matters not which site is chosen for a large scale power station, there will always be a strong locus of opposition in the area proposed for that siting regardless of the demand for electricity in other parts of the country.

If it is accepted that a certain quantity of electricity must be generated in the country (a point that is made emphatically in the EIR) then there needs to be some level of acceptance that the electricity has to be generated somewhere. The only other option is not to provide electricity at all or to provide small quantities of electricity that simply do not match the demands required for the economy to grow. The purpose of an EIA is to identify and assess the nature of impacts that are likely to occur and to try and define some threshold below which those impacts are deemed to be acceptable and above which they are not. People who oppose a project are likely to argue for that threshold to be as low as possible (viz. best that the project does not happen; other ways of meeting the demand) while the applicant is likely to argue for that threshold to be as high as possible. This is the reason that the decision is left to neither the applicant nor the opponents of the project.

As has been argued earlier we consider that many of the impacts have been exaggerated in the NPS EIA. Although not defined as such in the EIA, logic would suggest that an impact deemed to be of high significance would imply the possibility of a fatal flaw. There is no provision in the impact ranking for an impact greater than 'high' – hence 'high' must include the most unacceptable case. In these terms, and given the multiple impacts identified as being of high significance for all three sites (see Table 2) it would not be unreasonable to expect that all three sites would be disqualified. Contrary to this, all the specialists agreed that there were no fatal flaws at any of the three sites. This again suggests that the impact significance has been exaggerated in the EIA.

TABLE 2: Summary listing of sites where the potential impacts were considered to have high impact significance

Potential Impact	Sites with high impact significance
Geotechnical suitability	All three sites (positive impact)
Flora	Thyspunt/Dynefontein
Wetlands	Thyspunt
Terrestrial vertebrate fauna	Bantamsklip and Thyspunt
Terrestrial invertebrate fauna	Bantamsklip and Thyspunt
Marine biology	All sites
Economic impacts	Thyspunt (positive impact)
Social impacts	All sites
Visual impacts	All sites
Heritage impacts	Thyspunt
Tourism impacts	Thyspunt
Noise impacts	Thyspunt

Despite the apparent exaggeration of the impact significance and the issues described earlier in respect of the baseline assessment, it seems clear that of the three sites Thyspunt is relatively the

most sensitive. If the site selection process was limited to only choosing the least sensitive site, then the decision would be easy. However, the principle of an objective assessment and indeed the purported purpose of EIA in general requires that all issues germane to decision-making must be considered. For that to happen there should be some presentation of the costs (expressed as impacts on the environment) and the benefits that accrue. The site selection process presented in the EIA includes a discourse about the benefits of establishing a large scale power station in the Eastern Cape and the practitioners are correct to recognise and include this issue in the site selection process.

The weighting ascribed to the benefit of having the NPS in the Eastern Cape is higher than for the biophysical impacts, presumably because the benefits of transmission integration are deemed to be higher than the 'cost' of the biophysical impacts. It is easy to see why that could be perceived as a bias in favour of the applicant but it can just as easily be argued that the decision to weight the transmission integration higher than the biophysical impacts was actually driven by the need to be objective. There is a clear presentation in the EIA that the biophysical value of the Thyspunt site has been heightened by the loss of other components of the ecological system as a result of other developments that have taken place around the site. In the letter in which they reply to the DEA, the EIA practitioners state (and this is supported in the EIR) that 'the vast majority of the land around the Thyspunt site is covered by invasive alien plants, and the functioning of the mobile dune system has been virtually destroyed'.

What this means is that previous authority decisions have accepted a relatively marginal benefit for the cost of the impact on the sensitive dune bypass system. To the extent that the benefit (of the power station) at Thyspunt can be measured in terms of enhanced GDP growth, and economic and social development across the eastern part of the country, the suggestion that such a benefit cannot be deemed to weigh more heavily than the value of ecosystem loss is simply a case of double standards. If the authorities have been prepared to live with the cost of the impacts brought about by the development of the golf course and residences in the area then there is no apparent rationale in interpreting the presentation of benefits that are orders of magnitude higher than that, as bias on the part of the practitioners?

The same type of argument can be applied in terms of financial cost where it is argued by stakeholders that cost should not be a consideration in the site selection process. That argument is absurd. Of course cost must be considered because that cost will be borne by the users of electricity and there is a good economic and social development argument to be made for keeping those costs as low as possible. This is not to say that an intolerable impact should be allowed in order to reduce costs but simply that if impacts are deemed to be tolerable (as has been presented in the EIR) then it is entirely reasonable to use cost in differentiating between sites. In the DEADP letter it is stated 'it must be mentioned that although R6 388 million and R570 million are large amounts, they are relatively small amounts in terms of the total estimated cost of a nuclear power station'. We do not believe that this is a reasonable argument. Six billion rand is a large amount of money which electricity users must finance whether or not it is seen as a relative amount. Six billion rand can make a significant difference to the benefits that accrue though a development of this nature, so to simply dismiss that cost as being a relatively small amount is, in our view, misguided.

That said, it is essential that mitigation must be applied to reduce the impact significance as far as possible on the preferred site with special attention being paid to the impacts that have potentially higher significance. The EIR would be greatly enhanced and the choice of the Thyspunt as the preferred site significantly more credible if there was a section that provided a well argued assessment of the 'trade-off' between the 'costs' of impacts at Thyspunt and the benefits of establishing the NPS there. Although the EIA contains a section (9.27) in which transmission integration is described it is necessary to provide more detail and a clearer description to the readers of the value of 'system transient performance', 'quality of supply' and so forth. As has been argued earlier, we argue that it is acceptable to weight the benefits of an Eastern Cape siting potentially higher than the cost of the environmental impacts, but in order to do so credibly, those advantages must be clearly and credibly presented so that the benefits are well understood by the reader.

In summary it seems that the site selection process has been deemed to be biased because the interests of the applicant were used as criteria in the site selection process. That criteria was in turn also perceived to carry too much weight in the site selection process. If potential impacts were identified that are intolerable (fatal flaws) then the site where such impacts may manifest should in

fact be disqualified from any further consideration as a possible site for the power station. No fatal flaws were identified and mitigation was presented to ensure that these impacts are minimised. Taking this into consideration, it is entirely reasonable and objective to propose the site that maximises the potential benefits of the power station (the strengthening of the eastern Cape or keeping the costs as low as possible) even if it is to the applicant's benefit. In these terms we do not believe that the assessment was biased (other than exaggerating impact significance). However, it is clear that there is a strong perception of bias and so there are changes that must be made to the EIR to make it absolutely clear how the criteria was selected and how it was weighted. It seems highly unlikely that this will in any way change perceptions unless there is a more sensible and logical presentation of the impacts and the significance of those impacts.

Overall the EIR is good technically but appears to have been weakened by the significance rating system that has been used and the presentation of multiple impacts at their smallest component level rather than synthesising and integrating. The weak significance rating system has exaggerated the significance of the impacts and made the site selection process appear biased because of that. It has also had the effect of reducing conviction in the mitigation presented. It is strongly recommended that the significance rating scheme be revisited and dramatically improved so that the revised EIR is more sensibly and coherently presented. We argue that if these changes are made the EIR will be a considerably more robust assessment than it is at present.

2.3.5 Is the information in the report communicated clearly?

The report is well laid out, complex scientific jargon is by and large avoided, and language is kept simple and accessible to most people. The sections describing the project and the receiving environment contain many maps and diagrams, which are clear and explanatory. A few important terms are not defined and are not included in the list of abbreviations /acronyms or the glossary of terms (such as terms related to noise impact, $L_{Aeq,T}$, and $L_{req,d}$) but these are in the minority. The report is a good example of clear, explanatory writing.

3 RECOMMENDATIONS

- Ensure distribution of Final EIA reports to all venues that were determined during the scoping.
- Present a clear summary at the end of the existing environment chapter that clearly presents the key (decision-making) vulnerabilities of each of the three sites. This summary can then be used as a ready reference for readers when working through the impact assessment chapter;
- Strengthen the significance rating criteria and ensure that it is consistent with the principles that should apply (as detailed in the review).
- Group what are currently presented as multiple impacts into 'higher order' impacts with a view to simplifying the presentation of the assessment.
- Ensure that the benefits of locating the NPS on the eastern side of the country are clearly and effectively presented so that these can be meaningfully weighed up against costs of establishing the power station.