10 PLAN OF STUDY FOR ENVIRONMENTAL IMPACT ASSESSMENT

10.1 Purpose of the Plan of Study for EIA

The requirements of Regulation 28 of Government Notice R.543 promulgated in terms of section 24 of the National Environmental Management Act, 1998 (Act 107 of 1998) are as follows:

- A description of the tasks that will be undertaken as part of the environmental impact assessment process, including any specialist reports or specialised processes, and the manner in which such tasks will be undertaken;
- An indication of the stages at which the competent authority will be consulted;
- A description of the proposed method of assessing the environmental issues and alternatives, including the option of not proceeding with the activity;
- Particulars of the public participation process that will be conducted during the environmental impact assessment process; and
- Any specific information required by the competent authority.

In addition, there are a number of other requirements which the PoS for EIA must address. These include the following:

- The DEAT EIA Regulations Guideline Document;
- The DEA response to the Final Scoping Report and Plan of Study for EIA (when received).

10.2 Impact Assessment Phase

10.2.1 Introduction

The purpose of the Impact Assessment Phase of an EIA is as follows:

- Address issues that have been raised during the Scoping Phase;
- Assess alternatives to the proposed activity in a comparative manner;
- Assess all identified impacts and determine the significance of each impact; and
- Formulate mitigation measures.

Numerous acceptable approaches and methodologies exist by which the above purpose can be achieved. The legislation in South Africa, including the guideline documents published in support thereof, does not provide a specific methodology for the assessment of impacts. Rather, an assessment framework is provided within which environmental assessment practitioners are expected to structure a project-specific assessment methodology. This assessment framework recognises that there are different methodologies available for assessing the impact of a development but that the specific methodology selected must provide for the following:

- A clear process for impact identification, prediction and evaluation;

- The specification of impact identification techniques;
- Criteria for evaluating the significance of impacts;
- The design of mitigation measures to address impacts;
- Defining types of impacts (direct, indirect and/or cumulative); and
- Specification of uncertainties.

This section of the Final Plan of Study for EIA serves to describe the manner in which Lidwala EPS intends undertaking the Impact Assessment Phase of the EIA.

10.2.2 Impact Assessment Methodology

The objective of the assessment of impacts is to identify and assess all the significant impacts that may arise as a result of the proposed Weskusfleur substation and associated infrastructure. The process of assessing the impacts of the project encompasses the following four activities:

- Identification and assessment of potential impacts;
- Prediction of the nature, magnitude, extent and duration of potentially significant impacts;
- Identification of mitigation measures that could be implemented to reduce the severity or significance of the impacts of the activity; and
- Evaluation of the significance of the impact after the mitigation measures have been implemented i.e. the significance of the residual impact.

The possible impacts associated with the project were primarily identified in the Scoping Phase through on-site and desktop study and public consultation. In the Impact Assessment Phase, additional impacts will be identified through the more in-depth specialist investigations to be undertaken and through the ongoing consultation process with interested and affected parties.

In accordance with Government Notice R.543, promulgated in terms of section 24 of the National Environmental Management Act, 1998 (Act 107 of 1998), specialists will be required to assess the significance of potential impacts in terms of the following criteria:

- Cumulative impacts;
- Nature of the impact;
- Extent of the impact;
- Intensity of the impact;
- Duration of the impact;
- Probability of the impact occurring;
- Impact non-reversibility;
- Impact on irreplaceable resources; and
- Confidence level.

Issues will be assessed in terms of the following criteria:

- The **nature**, a description of what causes the effect, what will be affected and how it will be affected;
- The physical **extent**, wherein it is indicated whether:
  - 1 - the impact will be limited to the site;
  - 2 - the impact will be limited to the local area;
  - 3 - the impact will be limited to the region;
  - 4 - the impact will be national; or
  - 5 - the impact will be international;
- The **duration**, wherein it is indicated whether the lifetime of the impact will be:
  - 1 - of a very short duration (0–1 years);
  - 2 - of a short duration (2-5 years);
  - 3 - medium-term (5–15 years);
  - 4 - long term (> 15 years); or
  - 5 - permanent;
- The **magnitude of impact on ecological processes**, quantified on a scale from 0-10, where a score is assigned:
  - 0 - small and will have no effect on the environment;
  - 2 - minor and will not result in an impact on processes;
  - 4 - low and will cause a slight impact on processes;
  - 6 - moderate and will result in processes continuing but in a modified way;
  - 8 - high (processes are altered to the extent that they temporarily cease); or
  - 10 - very high and results in complete destruction of patterns and permanent cessation of processes;
- The **probability of occurrence**, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale where:
  - 1 - very improbable (probably will not happen;
  - 2 - improbable (some possibility, but low likelihood);
  - 3 - probable (distinct possibility);
  - 4 - highly probable (most likely); or
  - 5 - definite (impact will occur regardless of any prevention measures);
- the **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high;
- the **status**, which is described as either positive, negative or neutral;
- the degree to which the impact can be reversed;
- the degree to which the impact may cause irreplaceable loss of resources; and
- the degree to which the impact can be mitigated.

The **significance** is determined by combining the criteria in the following formula:

S = (E+D+M)*P; where

S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

The **significance weightings** for each potential impact are as follows:

- **< 30 points:** Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- **30 - 60 points:** Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- **> 60 points:** High (i.e. where the impact must have an influence on the decision process to develop in the area).

This EIA Report will assess the significance of impacts for all phases of the project i.e. construction, operation and decommissioning. The results of the above will be summarised in a tabular format. An example is provided below.

Potential Impact	Mitigation	Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
CONSTRUCTION PHASE									
BIODIVERSITY									
Impact 1: Loss or degradation of natural/ pristine habitat Koeberg Nature Reserve.	**nature of impact:**	Adverse Impact due to loss or degradation of natural habitat							
	with mitigation	1	4	2	3	**21**	**Low**	-	high
	without mitigation	2	5	2	4	**36**	**Medium**	-	high
	degree to which impact can be reversed:	None							high
	degree of impact on irreplaceable resources:	Low							high

10.2.3 Public Participation Process (PPP)

PPP during the impact assessment phase revolves around the review and findings of the EIA, which will be presented in the Draft Environmental Impact Report (EIR). All I&APs will be notified of the progress to date and availability of the Draft EIR, via mail, email and advertisements in local newspapers. A legislated period of 40 consecutive days will be allowed for public comment. Reports will be made available in the following way:

- Distribution for comment at central public places, which were used during the scoping phase. Provision has been made for the placement of the reports at three venues;
- The document will be made available to download from Lidwala's website; and
- Copies of CDs will be made available on request.

Either a public meeting or an open day and public meeting (depending on specific requests) are proposed to be held during this phase (venue to be confirmed). The meeting / open day will be facilitated by key members of the PPP project team. The purpose of the public meeting or open day will be to present the findings of the impact assessment. Focus group meetings will be held, if required, in accordance with topics of concern raised during the scoping phase as well as the assessment phase. I&APs will be given the opportunity to debate and discuss key issues and concerns.

All comments received during the EIA phase will be recorded in the comments and response report, which will be included in the draft and final EIR. The final EIR will incorporate public comment received on the Draft EIR and will be made available for public review on website with hard copies distributed mainly to the authorities, key stakeholders and at Koeberg's Visitors Centre.

Notification of Environmental Authorisation
All I&APs will receive a letter at the end of the process notifying them of the authority's decision, thanking them for their contributions, and explaining the appeals procedure.

10.2.4 Consultation with DEA

It is envisaged that consultation with DEA and DEA&DP will coincide with the compilation of the following key documents:

- PoS for EIA;
- Draft EIR and EMP; and
- Final EIR and EMP.

Consultation outside of the above deliverables will be undertaken as necessary in order to ensure that DEA and DEA&DP are aware of the status of the project.

10.2.5 Terms of Reference for Specialist Studies

A list of specialists that are involved in this study and their area of expertise are listed in **Table 10.1** below

Table 10.1: List of Specialist Studies

Specialist Study	Organisation Responsible for the Study
Impacts on terrestrial fauna & flora	Simon Todd Consulting
Visual impact assessment	Visual Resource Management Africa

Specialist Study	Organisation Responsible for the Study
Heritage Impact Assessment	Agency for Cultural Resource Management
Impacts on soils & agricultural potential	Agricultural Research Council
Surface water and freshwater ecology (wetlands)	Lidwala Consulting Engineers (SA) and The Freshwater Consulting Group
Social & Tourism Impact Study	Lidwala Consulting Engineers (SA)
Impacts on avifauna	Simon Todd Consulting
Traffic study	Lidwala Consulting Engineers (SA)
Geohydrology	GEOSS – Geohydrological and Spatial Solutions International (Pty) Ltd

The terms of reference for each of the above mentioned specialist studies during the EIA phase of the project are detailed below. Refer to the specialist studies **Appendix F – L** for the details on the methodology, scope of study, assessment approach, limitations, assumptions, data sourcing and review (previous studies conducted in the study area (Koeberg).

- **Fauna & Flora (Simon Todd Consulting)**

Although a brief site visit was conducted as part of the assessment, the current study is largely restricted to a desktop assessment and fieldwork during the EIA phase will be an important activity required to validate and refine the findings of this report. This will include the following studies and activities:

- If *Alternative 3* or *4* is selected as one of the preferred alternatives for the development, extensive fieldwork within the development footprint would be required to address the potential presence of species of conservation concern within these areas. This vegetation type is listed as Critically Endangered and a detailed evaluation of the current state and condition of the vegetation within the development footprint would be required.
- Depending on the alternatives taken into the EIA phase, as well as the final preferred option, a biodiversity offset may need to be investigated. This may apply to impacts on local biodiversity pattern as well as broad-scale pattern and process. Of relevance would also be the fine-scale vegetation map developed by the City of Cape Town as well as the previous studies conducted at Koeberg by Low (2008) and Boucher (2010).
- Clarify the power line arrangement for each Alternative so that the potential impacts of the power line on avifauna as well as flora can be properly evaluated for each Alternative that is taken through to the EIA stage.
- Where any extensive new power lines are required for the preferred options, bird activity within the affected will be monitored to evaluate the potential impact on vulnerable species.
- Although *Alternatives 1* and *2* for GIS are assumed to have very low impact on landscape connectivity due to their proximity to Koeberg, they are also within the coastal corridor which has a distinctive fauna and flora from the areas further inland which raises the possibility that these options may have a relatively high impact on landscape connectivity for these coastal species. The likely use and presence of such

species within the affected areas should therefore be investigated in greater detail during the EIA phase.
- For any Alternatives within the intact vegetation remnants, a detailed map of the locations and identity of listed species would be produced following vegetation surveys of the affected areas.
- Although there do not appear to be any wetlands within the affected areas, the preliminary site visit was carried out during the dry season and the lack of such features within the affected areas should be confirmed with a site visit during the wet season.
- Evaluate, based on the site attributes of the preferred Alternatives, what the most applicable mitigation measures to reduce the impact of the development on the site would be and if there are any areas where specific precautions or mitigation measures should be implemented.
- Assess the impacts identified in above in light of the site-specific findings and the final layout to be provided by the developer.

- **Visual (Visual Resource Management Africa)**

It is recommended that a full visual impact assessment is required to address the potential change to the landscape character. The following issues need to be addressed in the impact assessment:

- Landscape Character: A detailed assessment of the landscape character of the area and each site.
- Project Description: More detail on the project description and layout once it has been provided.
- Cumulative: A cumulative impact, in relation to an activity, is the impact of an activity that may not be significant but may become significant when added to the existing and potential impacts arising from similar or other activities in the area. The possible cumulative impacts of this project will be considered as much as possible.
- Impact Assessment: The identified alternatives will be assessed in terms of the potential visual impact they could have on their surroundings.
- Photo montages to depict the change in landscape character as seen from the main tourist view corridors.

- **Heritage (ACRM)**

In terms of the National Heritage Resources Act (No 25 of 1999), the potential impacts on archaeological, palaeontological, cultural and/or historical sites are required to be considered. The following is required:
- A Notification of Intent to Develop (NID) must be submitted to Heritage Western Cape (HWC) for comment.
- Heritage Impact Assessment (HIA) of the preferred site alternative must be undertaken.

- A Palaeontological Impact Assessment (Desk top study and fossil find procedure) must also be done.

- **Soil and Agricultural Potential (Agricultural Research Council)**

The soil and agricultural impact study needs to address the following:

- A clip of the study area is to be provided (1:250 000 scale).
- Land type and digital elevation data would be manipulated to provide the following:
- Land type map of the study area.
- Slope class map.
- Agricultural potential map, showing the distribution of dry land agricultural potential classes per land type.
- Tables defining the dominant, sub-dominant and sub-sub dominant soils per land type. The average texture and depth of each category will be provided.
- A land cover class map will be produced from the National Land Cover Database
- A report will accompany the maps, and will contain tables and describe the methodology used.

- **Surface Water and Wetland Study (Lidwala Consulting Engineers & The Freshwater Consulting Group)**

The surface water impact study needs to address the following:
- Local site catchments of all the alternatives should be assessed and peak flows should be calculated to determine if significant impacts are expected on the sites;
- Storm water management plan;
- Clarify the power line arrangement for each Alternative so that the potential impacts can be properly evaluated for each Alternative that is taken through to the EIA stage;
- Refer to previous studies conducted at Koeberg which include the Koeberg Training Facility;
- Assess the impacts identified in above in light of the site-specific findings and the final layout to be provided by the developer.

The wetland impact study needs to address the following:
- Check the footprint of the proposed activities against the existing wetland map for the site and adjacent areas, and light of my own knowledge of the area;
- Conduct a site visit to ground-truth the wetland map against the proposed routes and allow for summary PES assessments for water courses / wetlands;
- Liaise with other specialists and the project team regarding the proposed project, its implications and the details of its design;
- Consult City biodiversity information and tools (e.g. latest Biodiversity Network) should be consulted;

- Of relevance would also be the previous studies conducted at Koeberg which include the Koeberg Training Facility;
- Assess the potential impacts of the proposed activities for watercourses and other wetland ecosystems;
- Recommend mitigation measures for all identified impacts to watercourses and other wetland types;
- Provide input into the Construction and Operational Phase EMPS for the project's implementation

- **Geohydrology (Geohydrological and Spatial Solutions International (Pty) Ltd)**

The geohydrological assessment will involve a number of tasks, namely:

Task 1: Obtain all relevant data to the project (i.e. obtain data from the National Groundwater Archive (and associated groundwater use databases). Obtain relevant geological maps and geohydrological maps. Obtain relevant groundwater reports (of relevance would also be the previous studies conducted at Koeberg which include the Koeberg Training Facility). Compile a project GIS. Prepare for field work.

Task 2: Complete a site visit to each of the potential sites and complete a hydrocensus around each site (i.e. visit all boreholes on the property and measure yields and water quality (pH, EC, TDS and RP). Three groundwater samples will be collected for each site. The hydrocensus will extend for a radius of 1 km from the study area. The hydrogeology will be assessed at and surrounding each site in the field.

Task 3: Analyze the data, using geohydrological methods and evaluate the suitability of the potential sites for the construction of the substation. Rank the sites based on their suitability.

Task 4: The results will then be documented in a report – along with the findings and recommendations.

- **Social & Tourism (Lidwala Consulting Engineers)**

The purpose of the Social impact assessment will be to conduct a systematic analysis in advance of the likely impacts that the project will have on the day-to-day life of individuals and communities. The assessment will serve to identify issues that will need to be addressed by avoidance or mitigation, as well as social impacts that cannot be resolved. Recommendations regarding mitigation measures will be developed for inclusion in the EMP. The social impact assessment will also highlight potential positive impacts of the project, so that these impacts may be enhanced.

The study area for the social impact assessment will include:

- Communities and settlements that may be directly affected by physical proximity to the proposed new substation;

- Individuals, communities and institutions that may be indirectly affected as a result of the economic repercussions of the project;
- Land resources and people who may be affected by construction of the substation and associated infrastructure; and
- Institutions that would be involved in or affected by the policy and strategy and planning aspects of the project.

The social impact assessment will draw on information obtained during the public participation process. In particular, the consultation with stakeholders will enable the project team to identify their needs, expectations and perceptions regarding the proposed development. The steps that are envisaged for the social impact assessment are outlined below.

- *Projection and estimation of impacts*

  This phase of the S-EIA will concentrate on the anticipated impacts identified during the Scoping Study.
  - *Conceptualising social impacts.* This will entail assessing the *differences* between (a) predicted conditions *without* the development (extrapolated from the baseline projection) and (b) predicted conditions *with* the development. Due to the fact that social impacts are often consequences of environmental impacts (e.g. changes in water quality – an environmental impact – may lead to changes in health and quality of life – a social impact), this phase will involve an analysis and integration of results from various other specialist studies forming part of the EIA.
  - *Predicting responses to impacts.* This will entail determining the *significance* that affected individuals, communities and institutions attach to the identified social impacts. The importance of this phase stems from the fact that the responses of affected parties can have significant subsequent impacts. Hence, it is considered vital to estimate how the affected people would respond in terms of attitude and actions. This phase will rely heavily on information obtained during the public consultation process.
  - *Indirect and cumulative impacts.* This will entail estimating likely consequences and ripple effects of direct impacts. These may result from the incremental impacts of an action added to other past, present and reasonably foreseeable future.
  - *Rating impacts* in terms of their nature, extent, duration, intensity, probability, overall significance and mitigation potential.

- *Assessment of alternatives*

  This phase will involve the identification of project alternatives and, if appropriate, the formulation of recommendations regarding additional alternatives. A comparison will be made among these alternatives in terms of:
  - Their suitability under local conditions (including technical constraints);
  - Their potential positive and negative social impacts;
  - The extent to which these impacts are likely to be amenable to mitigation;

- The capacity requirements of monitoring and mitigating these impacts (including institutional human resource and financial capacity).

- *Development of mitigation and management measures*
  This phase will involve the formulation of a detailed *Management Plan* containing the following:
  - *Description of mitigation measures.* This component of the plan will offer recommendations regarding feasible and cost-effective measures to prevent significant negative impacts or reduce them to acceptable levels. These recommendations will be accompanied by proposed work programs, schedules, responsibilities for implementation and other necessary support services. Mitigation measures that may require particular attention include:
    - Policies to be adopted to control the spread of HIV/AIDS within the project area;
    - Measures to reduce the impact of the project on sense of place; and
    - A compensation program as mitigation for loss of amenities and assets.
  - *Description of monitoring requirements.* This component of the plan will propose detailed arrangements required for monitoring impacts and the implementation of mitigating measures. It will include a description of monitoring methodology, specific operations and features to be monitored, monitoring reporting relationships, and other relevant arrangements.

- **Traffic (Lidwala Consulting Engineers)**

The traffic impact assessment will be undertaken by Alf Raspi of Lidwala SA. The following study elements should be undertaken as part of the Traffic Impact Assessment:

- The traffic impact of construction vehicles will be analysed;
- During the construction the impact of construction vehicle and employee movements on the external road network and any disruption to the normal traffic flow as a result, will need to be examined; and
- The impact of general construction traffic on the pavement structure will need to be assessed.

10.3 Conclusions and Recommendations

Table 10.2 presents a summary of past, current and future Eskom EIA Environmental Authorizations within vicinity of Koeberg Power Station excluding high voltage line projects. The aim of the table is to illustrate the cumulative impact of developments in the study area. This table is also important information for the terms of reference for all specialist studies in terms of the assessment of the cumulative impact in the EIA phase.

Table 10.2: Past, Current and Future Eskom EIA Environmental Authorizations within vicinity of Koeberg Power Station excluding high voltage line projects

Project	Current, Past or Future	Approx. loss of un-transformed indigenous vegetation	Fynbos Type	Comments
Koeberg Admin and Training Centre Campus	Past	8 ha	Atlantis Dune Fynbos	EA did not require any biodiversity off-set however stewardship agreement is required
Ankerlig power station conversion and integration	Past	17.5 ha	Cape Flats Dune Strandveld	EA requires a biodiversity off set of 225 ha. Off-set not yet implemented due to project on hold
Weskusfleur Substation	Current	Alt 1: None Alt 4: 27 ha	Alt 1: Previously Transformed Alt 4: Atlantis Dune Fynbos	Biodiversity off set (if required) subject to EIA process
Nuclear-1	Current	265 ha	Some Cape Flats Dune Strandveld, some unlisted	Biodiversity off set (if required) subject to EIA process
Koeberg Transient Interim Nuclear Used Fuel Storage Facility	Future Proposed	None	Previously Transformed Cape Seashore Fynbos	Biodiversity off set (if required) subject to EIA process
Koeberg Thermal Power Uprate	Future Proposed	None	N/A	No biodiversity off-set required
Koeberg portable equipment store and water storage tank	Future Proposed	None	Previously Transformed	Biodiversity off set (if required) subject to EIA process
Koeberg Insulator Pollution Test Station	Future Proposed	None	Previously Transformed	Biodiversity off set (if required) subject to EIA process
Koeberg Visitor's Centre	Future Proposed	None	Previously Transformed	Biodiversity off set (if required) subject to EIA process

This Plan of Study for EIA is aimed at meeting the requirements of the EIA Regulations and the guidelines issued in respect thereof as a minimum.

The methodologies proposed for obtaining the information required to effectively identify and assess the potential environmental impacts of the project are considered to be comprehensive and sufficient to allow for the compilation of an EIR and EMP which

addresses I&AP concerns and which will provide the competent authority with the appropriate information necessary to allow for informed decision-making on the application for authorisation.