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# DECOMMISSIONING AND RELOCATION OF THE ACACIA AND PORT REX POWER STATION GAS TURBINES TO THE ANKERLIG POWER STATION SITE, WESTERN CAPE PROVINCE

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FINAL ENVIRONMENTAL MANAGEMENT PLAN (EMP):

ADDENDUM TO THE ENVIRONMENTAL MANAGEMENT PLAN  
(EMP) FOR THE ANKERLIG OPEN CYCLE GAS TURBINE POWER  
STATION IN THE ATLANTIS AREA, WESTERN CAPE PROVINCE  
(REVISION 1 OF THE EMP DATED SEPTEMBER 2007)

July 2009

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## PROJECT DETAILS

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- Title** : Environmental Impact Assessment Process  
Final Environmental Management Plan: Proposed  
Decommissioning and Relocation of the Acacia and  
Port Rex Power Station Gas Turbines to the Ankerlig  
Power Station Site, Western Cape Province
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## DEFINITIONS AND TERMINOLOGY

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The following should be read in conjunction with the Glossary of Terms and Abbreviations section of the Ankerlig Open Cycle Gas Turbine Power Station EMP (refer to page 2 of Ankerlig Power Station EMP).

**Cumulative impacts:** Impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities (e.g. discharges of nutrients and heated water to a river that combine to cause algal bloom and subsequent loss of dissolved oxygen that is greater than the additive impacts of each pollutant). Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.

**Direct impacts:** Impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity (e.g. noise generated by blasting operations on the site of the activity). These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.

**Endangered species:** Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating. Included here are taxa whose numbers of individuals have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction.

**Endemic:** An "endemic" is a species that grows in a particular area (is endemic to that region) and has a restricted distribution. It is only found in a particular place. Whether something is endemic or not depends on the geographical boundaries of the area in question and the area can be defined at different scales.

**Environmental management:** Ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.

**Indirect impacts:** Indirect or induced changes that may occur as a result of the activity (e.g. the reduction of water in a stream that supply water to a reservoir that supply water to the activity). These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.

**Interested and Affected Party:** Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups and the general public.

**Red data species:** Species listed in terms of the International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species, and/or in terms of the South African Red Data list. In terms of the South African Red Data list, species are classified as being extinct, endangered, vulnerable, rare, indeterminate, insufficiently known or not threatened (see other definitions within this glossary).

**Significant impact:** An impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.

## TABLE OF CONTENTS

	<b>PAGE</b>
<b>CHAPTER 1: OVERVIEW OF THE PROJECT</b> .....	<b>1</b>
1.1. Description of the Proposed Project .....	1
1.2. Potential Environmental Impacts associated with the Proposed Project .....	4
1.2.1. Potential Environmental Impacts associated with the Decommissioning of the Three Acacia Power Station Gas Units .....	4
1.2.2. Potential Environmental Impacts associated with the Decommissioning of the One Port Rex Power Station Gas Unit .....	4
1.2.3. Potential Environmental Impacts associated with the Relocation and Recommissioning of the Gas Units at Ankerlig Power Station .....	4
1.2.4. Potential Environmental Impacts associated with the 132kV Power Line .....	5
<b>CHAPTER 2: PURPOSE &amp; OBJECTIVES OF THE EMP ADDENDUM</b> .....	<b>13</b>
2.1. Purpose of the EMP and associated Addendums .....	13
2.2. Structure of the Addendum to the EMP .....	14
2.3. Project Team .....	15
<b>CHAPTER 3: MANAGEMENT PLAN: PLANNING &amp; DESIGN</b> .....	<b>16</b>
3.1. Goal for Planning .....	16
3.2. Objectives for Planning .....	16
OBJECTIVE: To ensure that the planning of the project responds to the identified environmental constraints and opportunities .....	16
<b>CHAPTER 4: MANAGEMENT PLAN: DECOMMISSIONING</b> .....	<b>19</b>
4.1. Overall Goal for Decommissioning .....	19
4.2. Objectives for Decommissioning .....	19
OBJECTIVE: Noise control .....	19
OBJECTIVE: Management of dust and emissions to air .....	20
OBJECTIVE: To ensure all decommissioning activities/practices/procedures are undertaken with the appropriate level of environmental awareness to minimise environmental risk, in line with the specifications of the EMP .....	22
<b>CHAPTER 5: MANAGEMENT PLAN: RELOCATION &amp; RE-COMMISSIONING OF GAS UNITS</b> .....	<b>23</b>
5.1. Overall Goal for Relocation & Re-commissioning of Gas Units .....	23
5.2. Project Responsibilities and Reporting Structure during the Relocation & Re-commissioning of Gas Units.....	23
5.3. Environmental Monitoring .....	23
5.4. Objectives for Relocation & Re-commissioning .....	24
OBJECTIVE: Noise control .....	24
OBJECTIVE: maintain the construction noise levels around the power station site within acceptable levels and minimise the impact on residential areas and communities .....	25
OBJECTIVE: Management of dust and emissions to air .....	26

OBJECTIVE: Traffic management and transportation of equipment and materials to site .....	27
OBJECTIVE: Protection of sensitive areas, vegetation and faunal habitats .....	29
OBJECTIVE: To ensure all construction activities/practices/procedures are undertaken with the appropriate level of environmental awareness to minimise environmental risk, in line with the specifications of the EMP .....	30
<b>CHAPTER 6: MANAGEMENT PLAN: CONSTRUCTION OF 132kV POWER LINE .....</b>	<b>32</b>
6.1. Overall Goal for Construction of 132kV Power Line.....	32
6.2. Objectives for Construction .....	32
OBJECTIVE: Protection of sensitive areas, vegetation and faunal habitats .....	32
OBJECTIVE: Protection of sites of heritage value .....	34
OBJECTIVE: To ensure all construction activities/practices/procedures are undertaken with the appropriate level of environmental awareness to minimise environmental risk, in line with the specifications of the EMP .....	36
<b>CHAPTER 7: MANAGEMENT PLAN: OPERATION AND MAINTENANCE .....</b>	<b>38</b>
7.1. Overall Goal for Operation .....	38
7.2. Objectives for Operation and Maintenance.....	38
OBJECTIVE: Maintain the noise levels around the power station site within acceptable levels and minimise the impact on residential areas and communities .....	38
OBJECTIVE: Management of dust and emissions to air .....	39
OBJECTIVE: Protection of vegetation and faunal habitats.....	40
OBJECTIVE: Protection of avifauna .....	42
OBJECTIVE: Minimisation of visual impacts.....	43
<b>APPENDICES</b>	
<b>Appendix A:</b> Environmental Authorisation	
<b>Appendix B:</b> Ankerlig OCGT Power Station EMP (Revision 1), September 2008	

## OVERVIEW OF THE PROJECT

## CHAPTER 1

### 1.1. Description of the Proposed Project

Whilst the additional power generated at the Ankerlig Power Station can be evacuated via the existing transmission lines being commissioned at Ankerlig, a second 400kV line would be required between the Koeberg Nuclear Power Station and the Acacia Power Station in order to cater for N-1-1 contingency conditions<sup>1</sup> as required by the Grid Code<sup>2</sup> for stations with an output larger than 1000 MW (in this case, both the Koeberg and Ankerlig power stations).

The existing power line between Acacia Power Station and Koeberg (which provides a dedicated back-up supply to Koeberg Nuclear Power Station in terms of the requirements of the National Nuclear Regulator) was constructed as a 400kV transmission power line but has been operated as a 132kV sub-transmission power line. This power line has been identified as the preferred option to establish the second Acacia – Koeberg 400kV line. This, however, means that an alternative arrangement must be implemented for the dedicated off-site supply to Koeberg.

Eskom Holdings Limited (Eskom) is, therefore, investigating the decommissioning of the existing three Acacia aero derivative gas turbine units<sup>3</sup> and the relocation of these units to the existing Ankerlig Power Station site in Atlantis, to stabilise the transmission network in the area and ensure the required dedicated back-up power supply to the Koeberg Nuclear Power Station. In addition, in order to provide additional operational flexibility and to streamline the phasing of the relocation of the Acacia units to the Ankerlig Power Station, an additional aero derivative gas turbine unit is proposed to be decommissioned and relocated to the Ankerlig Power Station site from Eskom's Port Rex Power Station site in East London.

Eskom is also proposing to turn the existing Koeberg-Dassenberg 132 kV line into Ankerlig and supply the dedicated line to connect the three Acacia and one Port Rex aero derivative gas turbines to Koeberg. This 132kV power line would be connected to a new 132kV HV yard adjacent to the now-to-be extended substation (high voltage (HV)

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<sup>1</sup> N-1-1 contingency conditions refers to the requirement that when two lines are out of service, the full output of the power station can still be evacuated.

<sup>2</sup> The Grid Code is intended to establish the reciprocal obligations of industry participants around the use of the Transmission System (TS) and operation of the interconnected power system (IPS). The Grid Code shall ensure, *inter alia*, that accountabilities of all parties are defined for the provision of open access to the TS; and that minimum technical requirements are defined for customers connecting to the TS

<sup>3</sup> Aero derivative gas turbines for power generation are adapted from those used in jet and turboshaft aircraft engines. These turbines are lightweight and thermally efficient, and have a capacity of up to 40 to 50 MW. Many aero derivative gas turbines for stationary use require a high-pressure external fuel gas compressor.



yard) at the Ankerlig Power Station. A 400/132kV transformer will be added to Ankerlig for effective network integration. This 132kV HV yard would be accommodated within the existing Ankerlig Power Station site.

The proposed project, therefore, involves the following activities:

- » Decommissioning and relocation of the three existing aero derivative gas turbine units at the Acacia Power Station (located on Portion 7 of the Farm Montague Gardens in Goodwood, Cape Town) to the existing Ankerlig Power Station (located on the Remainder of Farm 1395 in Atlantis Industria, Cape Town).
- » Decommissioning and relocation of one aero derivative gas turbine unit at Port Rex (located within the Woodbrook industrial area, Cape Road in East London) to the existing Ankerlig Power Station.
- » Turning-in of the existing Koeberg – Dassenberg 132kV line into a new 132kV High Voltage Yard (HV Yard) to transmit the power generated by these relocated units to the Koeberg Power Station.

The gas units from the Acacia and Port Rex power station sites are proposed to be located adjacent to Neil Hare Road within the existing Ankerlig Power Station area (refer to Figure 1.1). The aero derivative gas turbines that are the subject of this report are existing installed gas turbine units with an output of approximately 57 MW power each, and should not be confused with the approximately 150 MW Open Cycle Gas Turbine (OCGT) units installed at the Ankerlig Power Station. The Acacia aero derivative gas turbines are currently fuelled using kerosene. The aero derivative gas turbine units in question produce approximately 57 MW each and are much smaller than the existing OCGT units at Ankerlig that produce approximately 150MW of power each. The height of the aero derivative gas turbine units is approximately half that of the OCGT units (i.e. 14 m as opposed to the 30 m high smoke stacks of the OCGT units) and only about a quarter of the height of CCGT units (proposed to be approximately 60 m above ground level).



**Figure 1.1:** Aerial photograph of the Ankerlig Power Station site showing the existing power station infrastructure the power station expansion site, as well as the areas for the placement of Acacia and Port Rex gas units

## 1.2. Potential Environmental Impacts associated with the Proposed Project

### *1.2.1. Potential Environmental Impacts associated with the Decommissioning of the Three Acacia Power Station Gas Units*

The existing three gas units at the existing Acacia Power Station site near Goodwood will be decommissioned and will be relocated to the existing Ankerlig Power Station site near Atlantis.

In general, impacts associated with the decommissioning of the units are expected to be localised in the short-term. The power station currently has an existing air quality, noise and visual impact on the local area. The decommissioning of the units at the Acacia Power Station site will remove this existing impact from the area and is therefore expected to have a positive impact on the local environment. The existing transmission HV yard will not be decommissioned, and therefore the positive impact in terms of aesthetics of the local area is expected to be limited.

### *1.2.2. Potential Environmental Impacts associated with the Decommissioning of the One Port Rex Power Station Gas Unit*

One of the existing gas units at the Port Rex Power Station site in the Woodbrook industrial area of East London will be decommissioned and will be relocated to the existing Ankerlig Power Station site near Atlantis.

In general, impacts associated with the decommissioning of the units are expected to be localised in the short-term. The power station currently has an existing air quality, noise and visual impact on the local area. The decommissioning of one of the units at the Port Rex Power Station site will reduce this existing impact and is therefore expected to have a limited positive impact on the local environment. This Port Rex unit *may or may not* be returned to Port Rex at a later stage, depending on Eskom's requirements at the time. Therefore, any impacts identified may only be of a temporary nature.

### *1.2.3. Potential Environmental Impacts associated with the Relocation and Recommissioning of the Gas Units at Ankerlig Power Station*

The existing gas units will be decommissioned at the Acacia and Port Rex power station sites, and will be relocated to the existing Ankerlig Power Station site near Atlantis<sup>4</sup>. No additional land take will be required outside of the existing power station boundaries for the establishment of these units. Potential impacts associated with the proposed relocation of the units are expected to occur during both the construction and

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<sup>4</sup> Note that the Port Rex unit *may or may not* be returned to Port Rex at a later stage, depending on Eskom's requirements at the time.

operational phases. New impact sources associated with the relocation of these units are expected to be cumulative at a local level and would mainly include:

- » **Visual impacts** as a result of the additional gas infrastructure and 132kV HV yard on the site.
- » **Air quality impacts** associated with the construction phase (dust) and the operational phase (emissions from the gas units).
- » **Noise impacts** associated with the gas units.
- » **Ecological impacts** at a localised level as a result of the relocated gas units.
- » **Impacts on the social environment** as a result of intrusion impacts associated with the construction phase, as well as traffic movements associated with the relocation of the units from the Acacia Power Station site to the Ankerlig Power Station site.

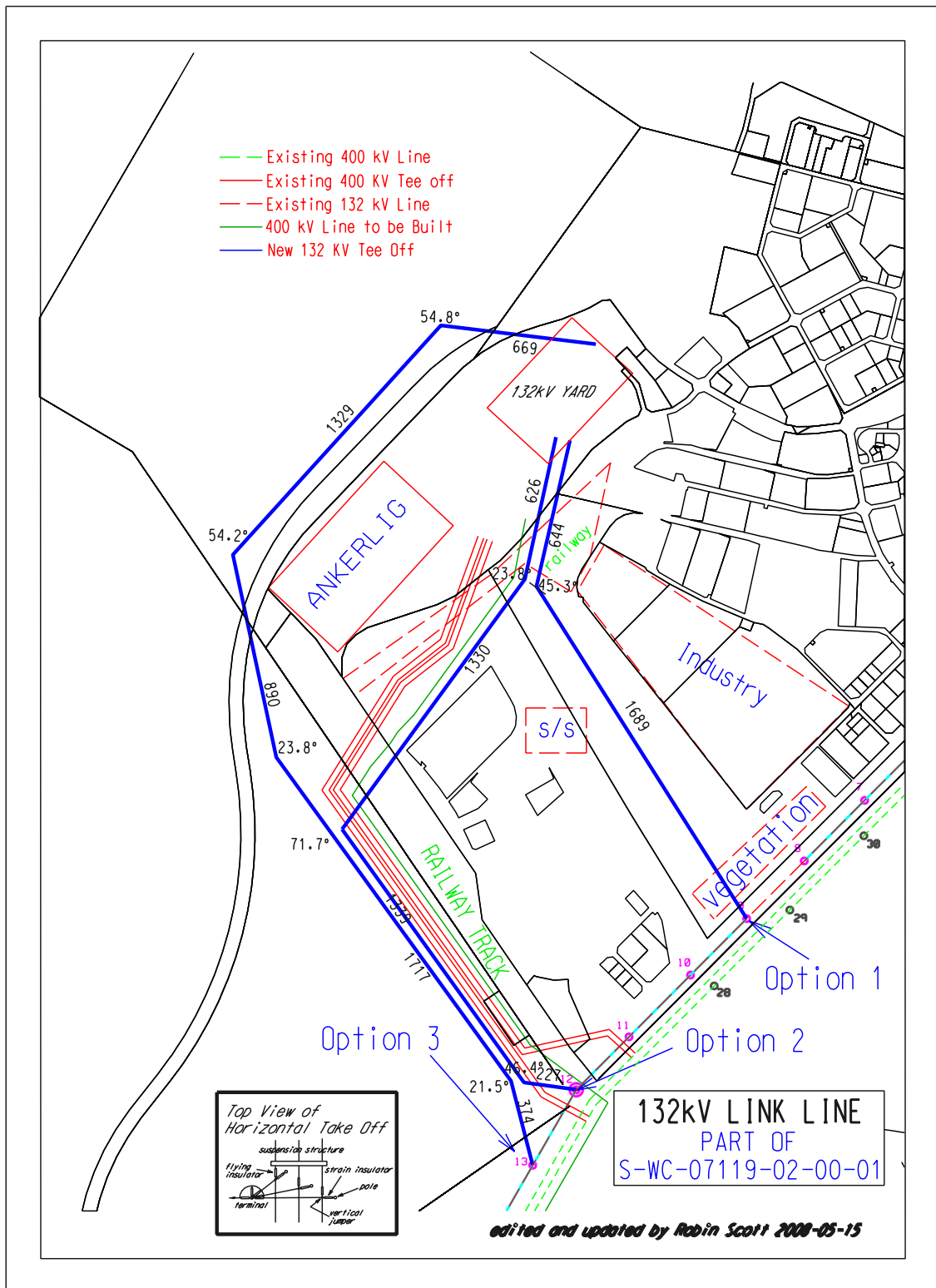
No environmental fatal flaws have been identified to be associated with the proposed decommissioning and relocation of the Acacia and Port Rex gas turbines to Ankerlig Power Station. It was concluded that the impacts could be successfully mitigated through the implementation of the management measures detailed in Ankerlig OCGT Power Station EMP (Revision 1 dated September 2007) as well as this addendum to the approved EMP.

#### *1.2.4. Potential Environmental Impacts associated with the 132kV Power Line*

Potential impacts associated with the proposed power line are expected to occur during the construction and operational phases, and have been identified through this scoping process include:

- » **Impacts on flora and fauna** as a result of the disturbance of habitats within the power line servitude and at tower footprints.
- » **Impacts on avifauna** as a result of collisions with the earthwire, electrocution and disturbance of habitats within the power line servitude.
- » **Impacts on heritage sites** as a result of disturbance or destruction during the construction phase, as well as due to visual impacts on heritage sites. No heritage sites have, however, been identified within the study area and therefore no impacts are expected as a result of the proposed project.
- » **Visual impacts** on the surrounding area.
- » **Impacts on the social environment** as a result of the creation of employment opportunities, impacts on land use, and impacts on sense of place.

From the evaluation of the alternative power line alternatives identified for the Koeberg-Dassenberg power line it was concluded that the construction of the power line along route **Option 1** would have the least impact on the environment (refer to Figure 1.2).



**Figure 1.2:** Proposed 132kV power line alternatives considered in the EIA process

No environmental fatal flaws have been identified to be associated with the proposed 132kV power line, provided the nominated preferred alternative is implemented. It was concluded that the impacts could be successfully mitigated through the implementation of the management measures detailed in Ankerlig OCGT Power Station EMP (Revision 1 dated September 2007) as well as this addendum to the approved EMP.

## PURPOSE & OBJECTIVES OF THE EMP ADDENDUM

## CHAPTER 2

An Environmental Management Plan (EMP) provides a link between the impacts predicted and mitigation measures recommended within the EIA report, and the implementation activities of a project to ensure that these activities are managed and mitigated so that unnecessary or preventable environmental impacts do not result.

Eskom have an approved EMP in place for the construction, operation and maintenance activities associated with the Ankerlig OCGT Power Station (refer to the EMP (Revision 1 dated September 2007) – refer to Appendix B). This EMP is currently successfully utilised and in force at the operational units of the OCGT power station (and associated 400 kV transmission power lines), and was successfully enforced on the construction site for the 5 units associated with the Gas 1 Project. Regular compliance audits to the EMP requirements are undertaken by the Environmental Control Officer and an external auditor. As such, it is not deemed necessary to reiterate all the specifications of this approved EMP which are currently being applied to all components of the bigger Ankerlig OCGT Power Station project, and therefore this *addendum to the approved EMP* has been prepared to specifically address the potential impacts resulting from the decommissioning and relocation of the Acacia and Port Rex gas turbines to Ankerlig Power Station.

### 2.1. Purpose of the EMP and associated Addendums

The purpose of the Ankerlig OCGT Power Station EMP (Revision 1 dated September 2007) as well as this addendum to the approved EMP is to assist in ensuring continuous improvement of environmental performance, reducing negative impacts and enhance positive effects during the construction and operation of the project. An effective EMP is concerned with both the immediate outcome as well as the long-term impacts of the project.

The EMP has the following objectives:

- » To outline mitigation measures, and environmental specifications which are required to be implemented for the planning, decommissioning, relocation and re-commissioning, rehabilitation and operation/maintenance phases of the project in order to minimise the extent of environmental impacts, and to manage environmental impacts associated with the project.
- » To identify measures that could optimise beneficial impacts.
- » To ensure that the decommissioning, relocation and re-commissioning, rehabilitation and operation/maintenance phases do not result in undue or reasonably avoidable adverse environmental impacts, and ensure that any potential environmental benefits are enhanced.

- » To ensure that all environmental management conditions and requirements as stipulated in the Environmental Authorisation (once issued) are implemented throughout the project life-cycle.
- » To ensure that all relevant legislation (including national, provincial and local) is complied with during the construction and operation phases
- » To identify entities who will be responsible for the implementation of the measures and outline functions and responsibilities.
- » To propose mechanisms for monitoring compliance, and preventing long-term or permanent environmental degradation.
- » To facilitate appropriate and proactive response to unforeseen events or changes in project implementation that were not considered in the EIA process.

This addendum to the approved EMP has been developed as a set of environmental specifications (i.e. principles of environmental management) which are appropriately contextualised to provide clear guidance in terms of the implementation of these specifications for the proposed project.

This EMP addendum for the proposed decommissioning and relocation of the Acacia and Port Rex Power Station gas turbines to the Ankerlig Power Station site has been compiled in accordance with Section 34 of the EIA Regulations and will be further developed in terms of specific requirements listed in any authorisations issued for the proposed project. It should be noted that since this addendum to the EMP is part of the EIA process undertaken for the proposed project, it is important that this document be read in conjunction with the Scoping Report (March 2008), EIA Report (September 2008) and Environmental Authorisation (issued on 20 February 2009 – refer to Appendix A). This will contextualise the EMP addendum. This addendum to the approved EMP must be read in conjunction with the relevant sections and appendices of the Ankerlig OCGT Power Station EMP (Revision 1 dated September 2008 – refer to Appendix B). The EMP forms part of the contract documentation for the construction phase of the development.

## 2.2. Structure of the Addendum to the EMP

Several procedures are necessary for Eskom to achieve environmental compliance for the proposed decommissioning and relocation of the aero-derivative gas turbines from Acacia and Port Rex to Ankerlig Power Station. These are described in further detail within the Ankerlig OCGT Power Station EMP (Revision 1 dated September 2008). In order to ensure site-specific compliance associated with the proposed decommissioning and relocation of the Acacia and Port Rex Power Station gas turbines to the Ankerlig Power Station site, this EMP addendum includes the statement of an over-arching environmental **goal**, as well as lists a number of **objectives** in order to meet this goal. The management plan has been structured in table format in order to show the links between the goals for each phase and their associated objectives, activities/risk sources, mitigation actions monitoring requirements and performance indicators. A specific

environmental management plan table has been established for each environmental objective. The information provided within the EMP table for each objective is illustrated below:

**OBJECTIVE:** Description of the objective, which is necessary in order to meet the overall goals; these take into account the findings of the environmental impact assessment specialist studies

<b>Project component/s</b>	List of project components affecting the objective
<b>Potential Impact</b>	Brief description of potential environmental impact if objective is not met
<b>Activity/risk source</b>	Description of activities which could impact on achieving the objective
<b>Mitigation: Target/Objective</b>	Description of the target; include quantitative measures and/or dates of completion

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
List specific action(s) required to meet the mitigation target/objective described above.	Who is responsible for the measures	Time periods for implementation of measures

<b>Performance Indicator</b>	Description of key indicator(s) that track progress/indicate the effectiveness of the management plan.
<b>Monitoring</b>	Mechanisms for monitoring compliance; the key monitoring actions required to check whether the objectives are being achieved, taking into consideration responsibility, frequency, methods and reporting

### 2.3. Project Team

Jo-Anne Thomas, the principle author of this addendum to the Environmental Management Plan, is a registered Professional Natural Scientist (in the practice of environmental science) with the South African Council for Natural Scientific Professions. She has extensive knowledge and experience in environmental impact assessment and environmental management, having been involved in EIA processes over the past ten (10) years.



**MANAGEMENT PLAN: PLANNING & DESIGN**

**CHAPTER 3**

**3.1. Goal for Planning**

**Overall Goal for Planning:** Undertake the planning phase of the decommissioning and relocation of the Acacia and Port Rex Power Station gas turbines to the Ankerlig Power Station site in a way that:

- » Ensures that the planning of the project components responds to the identified environmental constraints and opportunities.
- » Ensures that the best environmental options are selected for the required decommissioning, relocation and recommissioning, and operation activities associated with the project.
- » Enables the required decommissioning, relocation and recommissioning activities to be undertaken without significant disruption to other land uses in the area.

This addendum to the approved EMP must be read in conjunction with the relevant sections and appendices of the Ankerlig OCGT Power Station EMP (Revision 1 dated September 2008).

**3.2. Objectives for Planning**

In order to meet this goal, the following objectives have been identified, together with necessary actions and monitoring requirements.

***OBJECTIVE: To ensure that the planning of the project responds to the identified environmental constraints and opportunities***

<b>Project component/s</b>	Project components affecting the objective: <ul style="list-style-type: none"> <li>» Gas turbine units</li> <li>» Power line towers</li> <li>» access roads</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Design fails to respond optimally to the environmental consideration</li> <li>» Power line route that degrades environment unnecessarily, particularly with respect to visual aesthetics, loss of indigenous flora, and erosion</li> <li>» Unacceptable noise and air emissions from power station components</li> </ul>
<b>Activities/risk sources</b>	<ul style="list-style-type: none"> <li>» Alignment of power line and positioning of towers and access roads within the approved power line corridor</li> <li>» Positioning of the gas turbines within the Ankerlig Power Station</li> </ul>

	footprint
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» To ensure that the design of the project components respond to the identified environmental constraints and opportunities</li> <li>» To ensure selection of best environmental option for the decommissioning, relocation and recommissioning of the gas turbines and alignment for the power line</li> </ul>

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Undertake appropriate pre-construction planning, including a master plan indicating site layout and infrastructure placement	Eskom/landscape architect/engineer	Pre-construction
In order to reduce the overall noise emission to acceptable levels, final design of equipment will ensure the level of noise emission from the plant must be limited to levels guaranteed by the contractor.	Eskom/design engineer	Design
Undertake negotiations with affected landowners within the approved power line corridor and agree on landowner-specific conditions for construction and maintenance	Negotiator	Planning Phase
Undertake a detailed geotechnical survey of the proposed transmission line tower positions in order to fully understand the soils in terms of founding conditions and erosion potential	Eskom	Design Phase
Consider planning and design level mitigation measures recommended by the specialists.	Engineering Design Consultant	Design Phase
Ensure that bird-friendly power line tower and conductor designs are used.	Eskom Transmission design team	Design Phase
Balance technical and financial considerations against environmental constraints and opportunities in finalising the design of key elements (such as the power station components (in terms of noise and air emission mitigation), tower design and required (servitude width).	Eskom	Tender Design & Design Phase
Ensure that any new access road required for accessing the power line are designed to allow for the natural flow of water where required. Crossing of eroded areas on access routes to the power line servitude shall be thoroughly planned and installed according to design and contract specifications.	Engineering Design Consultant	Design Phase
Design the gas units to match the aesthetics of the Ankerlig site and comply with the standards for fuel storage on the site.	Engineering Design Consultant	Design Phase

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» Design meets objectives and does not degrade the environment</li> <li>» Design and layouts etc respond to the mitigation measures and</li> </ul>
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	<p>recommendations in the EIA report.</p> <ul style="list-style-type: none"><li>» Final installed power station components minimises any negative environmental impacts and maximises any benefits.</li><li>» Final surveyed route alignment minimises any negative environmental impacts and maximises any benefits.</li></ul>
<b>Monitoring</b>	<ul style="list-style-type: none"><li>» Ensure that the design implemented meets the objectives and mitigation measures in the EIA report through review of the design by the Project Manager and Environmental Control Officer (ECO) prior to the commencement of construction.</li></ul>

## MANAGEMENT PLAN: DECOMMISSIONING

## CHAPTER 4

The existing three gas units at the existing Acacia Power Station site near Goodwood will be decommissioned and will be relocated to the existing Ankerlig Power Station site near Atlantis.

One of the existing gas units at the Port Rex Power Station site in the Woodbrook industrial area of East London will be decommissioned and will be relocated to the existing Ankerlig Power Station site near Atlantis.

In general, impacts associated with the decommissioning of the units are expected to be localised in the short-term.

### 4.1. Overall Goal for Decommissioning

**Overall Goal for Decommissioning:** Undertake the decommissioning phase in a way that:

- » Ensures that decommissioning activities are properly managed in respect of environmental aspects and impacts.
- » Enables the decommissioning activities to be undertaken without significant disruption to other land uses in the area, in particular with regard to noise impacts, traffic and road use, and effects on local residents.

This addendum to the approved EMP must be read in conjunction with the relevant sections and appendices of the Ankerlig OCGT Power Station EMP (Revision 1 dated September 2008). This addendum relates only to activities associated with the decommissioning and relocation of the Acacia and Port Rex gas turbines to Ankerlig Power Station. Generic environmental specifications and guidelines included within this approved EMP are not repeated here.

### 4.2. Objectives for Decommissioning

In order to meet the goals, the following objectives have been identified, together with necessary actions and monitoring requirements.

#### ***OBJECTIVE: Noise control***

Noise levels associated with decommissioning activities and traffic during decommissioning of the gas units are expected to have a short-term, localised impact

on the surrounding areas. This may impact on surrounding residents, particularly in the case of Acacia Power Station which is situated in close proximity to residential areas.

<b>Project component/s</b>	List of project components affecting the objective: » Gas units at Acacia Power Station and Port Rex Power Station
<b>Potential Impact</b>	» Nuisance noise from decommissioning activities affecting the surrounding community
<b>Activity/risk source</b>	» Decommissioning of gas units » Traffic movement to and from the power station sites
<b>Mitigation: Target/Objective</b>	» To minimise noise to any surrounding residences from the decommissioning activities

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
On-site construction activities will be limited to 6:00am to 6:00pm Monday – Saturday (excluding public holidays) (in terms of the Environment Conservation Act). Should construction activities need to be undertaken outside of these times, the surrounding communities will be notified and appropriate approval will be obtained from the National Department of Environment (DEA).	Contractor	Duration of contract
Noise associated with decommissioning will be managed according to the Noise Control Regulations and SANS 10103.	Contractor	Duration of contract
All decommissioning equipment, including vehicles, will be properly and appropriately maintained in order to minimise noise generation.	Contractor	Duration of contract

<b>Performance Indicator</b>	» No complaints received concerning noise
<b>Monitoring</b>	» A complaints register will be maintained, in which any complaints from the community will be logged. Complaints will be investigated and, if appropriate, acted upon. » An incident reporting system will be used to record non-conformances to the EMP.

***OBJECTIVE: Management of dust and emissions to air***

During the decommissioning phase, limited gaseous or particulate emissions are anticipated from exhaust emissions from vehicles and equipment on-site, as well as possible dust from the movement of vehicles and decommissioning activities.

<b>Project component/s</b>	Project components affecting the objective: » Gas units at Acacia Power Station and Port Rex Power Station
<b>Potential Impact</b>	» Dust and particulates from decommissioning activities and vehicle movement to and on-site » Release of minor amounts of air pollutants (for example NO <sub>2</sub> , CO, PM10 and SO <sub>2</sub> ) from vehicles and construction equipment
<b>Activities/risk sources</b>	» Decommissioning of gas units » Traffic movement to and from the power station sites
<b>Mitigation: Target/Objective</b>	» To ensure emissions from all vehicles are minimised, where possible, for the duration of the decommissioning phase » To minimise nuisance to the community from dust emissions and to comply with workplace health and safety requirements for the duration of the decommissioning phase

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Appropriate dust suppressant will be applied on all exposed areas as required to minimise/control airborne dust.	Contractor	Duration of contract
Speed of construction vehicles will be restricted, as defined by the SHE Representative.	Contractor	Duration of contract
Burning or incineration of any materials on-site will be prohibited.	Contractor	Duration of contract
Vehicles and equipment will be maintained in a road-worthy condition at all times.	Contractor	Duration of contract
If monitoring results or complaints indicate inadequate performance against the criteria indicated, then the source of the problem will be identified, and existing procedures or equipment modified to ensure the problem is rectified.	Contractor	Duration of contract

<b>Performance Indicator</b>	» No complaints from affected residents or community regarding dust or vehicle emissions
<b>Monitoring</b>	Monitoring will be undertaken to ensure emissions are not exceeding the prescribed levels via the following methods: » Visual daily inspections of dust generation by activities throughout the decommissioning phase. » Immediate reporting by personnel of any potential or actual issues with nuisance dust or emissions to the Site Manager or SHE Representative. » A complaints register will be maintained, in which any complaints from residents/the community will be logged. Complaints will be investigated and, where appropriate, acted upon. » An incident reporting system will be used to record non-conformances to the EMP.

***OBJECTIVE: To ensure all decommissioning activities/practices/procedures are undertaken with the appropriate level of environmental awareness to minimise environmental risk, in line with the specifications of the EMP***

The environmental specifications are required to be underpinned by a series of Method Statements, within which the Contractors and Service Providers are required to outline how any identified environmental risks will practically be mitigated and managed for the duration of the contract. That is, the Contractor will be required to describe how specified requirements will be achieved through the submission of written Method Statements to the Site Manager (and ECO) for approval. The Site Manager (and ECO) will file the method statements.

A Method Statement is defined as “a written submission by the Contractor in response to the environmental specification or a request by the Project Manager/Site Manager, setting out the plant, materials, labour and method the Contractor proposes using to conduct an activity, in such detail that the Project Manager/Site Manager is able to assess whether the Contractor’s proposal is in accordance with the Specifications and/or will produce results in accordance with the Specifications”. A Method Statement must cover applicable details with regards to:

- » Decommissioning procedures
- » Materials and equipment to be used
- » Getting the equipment to and from site
- » How the equipment/material will be moved while on-site
- » How and where material will be stored
- » The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur
- » Timing and location of activities
- » Compliance/non-compliance with the Specifications, and
- » Any other information deemed necessary by the Project Manager/Site Manager and ECO.

The Contractor may not commence the activity covered by the Method Statement until it has been approved by the Site Manager/ECO (or as per the reporting structures in the Ankerlig OCGT Power Station EMP), except in the case of emergency activities and then only with the consent of the Site Manager. Approval of the Method Statement will not absolve the Contractor from their obligations or responsibilities in terms of their contract.

## MANAGEMENT PLAN: RELOCATION & RE-COMMISSIONING OF GAS UNITS

## CHAPTER 5

### 5.1. Overall Goal for Relocation & Re-commissioning of Gas Units

**Overall Goal for Relocation & Re-commissioning:** Undertake the relocation & re-commissioning phase in a way that:

- » Ensures that relocation & re-commissioning activities are properly managed in respect of environmental aspects and impacts.
- » Enables the relocation & re-commissioning activities to be undertaken without significant disruption to other land uses in the area, in particular with regard to noise impacts, traffic and road use, and effects on local residents.

This addendum to the approved EMP must be read in conjunction with the relevant sections and appendices of the Ankerlig OCGT Power Station EMP (Revision 1 dated September 2008). This addendum relates only to activities associated with the decommissioning and relocation of the Acacia and Port Rex gas turbines to Ankerlig Power Station. Generic environmental specifications and guidelines included within this approved EMP are not repeated here.

### 5.2. Project Responsibilities and Reporting Structure during the Relocation & Re-commissioning of Gas Units

Several professionals will form part of the relocation and recommissioning team. The most important from an environmental perspective are the **Project Manager/Site Manager**, the **Environmental Control Officer (ECO)**, the **contractor** and the **developer**. Functions and responsibilities will be as set out in Section 2 of the approved Ankerlig OCGT Power Station EMP (Revision 1 dated September 2007).

### 5.3. Environmental Monitoring

On site monitoring during relocation and recommissioning will be undertaken by a suitably qualified Environmental Control Officer (ECO). The ECO shall be appointed before any land clearing or construction activities commence and shall remain employed until all rehabilitation measures are completed and the site is ready for operation. The ECO shall keep records of all activities on site, problems identified, transgressions noted, as well as a task schedule of tasks undertaken by the ECO. Records relating to monitoring and auditing shall be kept on site and made available to any relevant and competent authority in respect of this development on request.



An independent consultant shall be appointed upon completion of the relocation and recommissioning of the gas units to conduct a consolidated audit. The results of this audit shall be submitted to DEA for record purposes. This final audit report must indicate the date of the audit, the name of the auditor and the outcome of the audit in terms of compliance with the environmental authorisation conditions and the requirements of this EMP.

#### 5.4. Objectives for Relocation & Re-commissioning

In order to meet the goals, the following objectives have been identified, together with necessary actions and monitoring requirements.

##### *OBJECTIVE: Noise control*

Noise levels associated with relocation & re-commissioning activities and traffic during relocation & re-commissioning of the gas units are expected to have a short-term, localised impact on the surrounding areas.

<b>Project component/s</b>	List of project components affecting the objective: » Transportation of gas units from Acacia Power Station and Port Rex Power Station to Ankerlig Power Station
<b>Potential Impact</b>	» Nuisance noise from relocation & re-commissioning activities affecting the surrounding community
<b>Activity/risk source</b>	» Traffic movement to and from the power station sites » Re-commissioning of gas units at Ankerlig Power Station site
<b>Mitigation: Target/Objective</b>	» To minimise noise to any surrounding residences from the relocation & re-commissioning activities

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
The units from Acacia and Port Rex must be serviced before being relocated to the Ankerlig site.	Eskom	Pre-construction
On-site construction activities will be limited to 6:00am to 6:00pm Monday – Saturday (excluding public holidays) (in terms of the Environment Conservation Act). Should construction activities need to be undertaken outside of these times, the surrounding communities will be notified and appropriate approval will be obtained from DEA.	Contractor	Duration of contract
Noise associated with relocation & re-commissioning will be managed according to the Noise Control Regulations and SANS 10103.	Contractor	Duration of contract
All re-commissioning equipment, including vehicles, will be properly and appropriately maintained in order to	Contractor	Duration of contract

Mitigation: Action/control	Responsibility	Timeframe
minimise noise generation.		

<b>Performance Indicator</b>	» No complaints received concerning noise
<b>Monitoring</b>	» A complaints register will be maintained, in which any complaints from the community will be logged. Complaints will be investigated and, if appropriate, acted upon. » An incident reporting system will be used to record non-conformances to the EMP.

*OBJECTIVE: maintain the construction noise levels around the power station site within acceptable levels and minimise the impact on residential areas and communities*

<b>Project component/s</b>	» Construction activities during the construction phase
<b>Potential Impact</b>	» Noise impacts on surrounding areas
<b>Activity/risk source</b>	» Construction activities, i.e. excavating, loading and unloading of trucks, piling, material transport, general building activities, etc.
<b>Mitigation: Target/Objective</b>	» Minimise noise impacts during the construction phase

Mitigation: Action/control	Responsibility	Timeframe
Regular maintenance of equipment and fitting of silencers where appropriate.	Contractor in consultation with Specialist	Duration of contract
Training of personnel to adhere to operational procedures that reduce the occurrence and magnitude of individual noisy events.	Contractor in consultation with Specialist	Duration of contract
Restricting noisy operation such as piling or rock breaking, etc. to daytime hours.	Contractor	Duration of contract

<b>Performance Indicator</b>	» No complaints regarding noise during construction activities » The measured noise levels around the boundary of the site to be less than 70 dBA during day-time and 60 dBA during night-time. » The noise levels in Avondale and Protea Park residential areas not to exceed 50 dBA and 45 dBA during daytime and night-time respectively, due to the power station operations.
<b>Monitoring</b>	» Biannual noise monitoring during construction lifespan on power station perimeter. The closest residential area to the site and at two selected locations outside the perimeter should also be included.

	<ul style="list-style-type: none"> <li>» The noise monitoring should be performed in accordance with SANS 10103 and the report submitted to the appropriate authority.</li> <li>» An incident reporting system must be used to record non-conformances to the EMP.</li> </ul>
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**OBJECTIVE: Management of dust and emissions to air**

During the relocation & re-commissioning phase, limited gaseous or particulate emissions are anticipated from exhaust emissions from vehicles and equipment on-site, as well as possible dust from the movement of vehicles and relocation & re-commissioning activities.

<b>Project component/s</b>	Project components affecting the objective: <ul style="list-style-type: none"> <li>» Transportation of gas units from Acacia Power Station and Port Rex Power Station to Ankerlig Power Station</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Dust and particulates from re-commissioning activities and vehicle movement to and on-site</li> <li>» Release of minor amounts of air pollutants (for example NO<sub>2</sub>, CO, PM10 and SO<sub>2</sub>) from vehicles and construction equipment</li> </ul>
<b>Activities/risk sources</b>	<ul style="list-style-type: none"> <li>» Traffic movement to and from the power station sites</li> <li>» Re-commissioning of gas units at Ankerlig Power Station site</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» To ensure emissions from all vehicles are minimised, where possible, for the duration of the decommissioning phase</li> <li>» To minimise nuisance to the community from dust emissions and to comply with workplace health and safety requirements for the duration of the relocation &amp; re-commissioning phase</li> </ul>

Mitigation: Action/control	Responsibility	Timeframe
Appropriate dust suppressant will be applied on all exposed areas as required to minimise/control airborne dust.	Contractor	Duration of contract
Speed of construction vehicles will be restricted, as defined by the SHE Representative.	Contractor	Duration of contract
Burning or incineration of any materials on-site will be prohibited.	Contractor	Duration of contract
Vehicles and equipment will be maintained in a road-worthy condition at all times.	Contractor	Duration of contract
If monitoring results or complaints indicate inadequate performance against the criteria indicated, then the source of the problem will be identified, and existing procedures or equipment modified to ensure the problem is rectified.	Contractor	Duration of contract

<b>Performance Indicator</b>	» No complaints from affected residents or community regarding dust or vehicle emissions
<b>Monitoring</b>	<p>Monitoring will be undertaken to ensure emissions are not exceeding the prescribed levels via the following methods:</p> <ul style="list-style-type: none"> <li>» Visual daily inspections of dust generation by activities throughout the relocation &amp; re-commissioning phase.</li> <li>» Immediate reporting by personnel of any potential or actual issues with nuisance dust or emissions to the Site Manager or SHE Representative.</li> <li>» A complaints register will be maintained, in which any complaints from residents/the community will be logged. Complaints will be investigated and, where appropriate, acted upon.</li> <li>» An incident reporting system will be used to record non-conformances to the EMP.</li> </ul>

***OBJECTIVE: Traffic management and transportation of equipment and materials to site***

The relocation phase of the project will be the most significant in terms of generating traffic impacts; resulting from the transport of the gas turbines from Acacia and Port Rex to Ankerlig, as well as from the transport of construction crews to the site. Potential impacts on traffic movements and at intersections is, however, not expected to be more significant than that experienced as a result of the construction of the OCGT power station at the Ankerlig site. This impact is not considered to be significant (refer to the EIA undertaken for the Ankerlig Conversion and Transmission Integration Project; Savannah Environmental, 2008).

<b>Project component/s</b>	<p>List of project components affecting the objective:</p> <ul style="list-style-type: none"> <li>» Relocation of gas units from Acacia and Port Rex sites</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Impacts on traffic movements</li> <li>» Risk of accidents</li> </ul>
<b>Activity/risk source</b>	» Traffic congestion from abnormal weight or sized loads on roads between the Acacia and Port Rex power stations and the Ankerlig site
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» To minimise impact of traffic associated with the relocation of the Acacia and Port Rex gas turbines to the Ankerlig site on local traffic</li> <li>» To minimise potential for negative interaction between pedestrians or sensitive users and traffic associated with the relocation</li> <li>» To ensure all vehicles are roadworthy and all materials/equipment are carried appropriately and within any imposed permit/licence conditions</li> </ul>

Mitigation: Action/control	Responsibility	Timeframe
All relevant permits for abnormal loads will be applied for from the relevant authority.	Contractor (or appointed transportation contractor)	Pre-construction
The relocation activities associated with the gas units will accommodate the existing access of commuters and minimise traffic disruption through careful planning and co-ordination with the appropriate authorities.	Contractor (or appointed transportation contractor)	Pre-construction
No deviation from approved transportation routes will be allowed, unless roads are closed for whatever reason outside the control of the contractor.	Contractor	Duration of contract
Appropriate road management strategies will be implemented on external and internal roads with all employees and contractors required to abide by standard road and safety procedures. A management plan will be submitted for Eskom's acceptance.	Contractor (or appointed transportation contractor)	Pre-construction
Any traffic delays as a result of construction traffic will be co-ordinated with the appropriate authorities.	Contractor	Duration of contract
A designated access to the Acacia, Port Rex and Ankerlig sites will be created to ensure safe entry and exit.	Contractor	Pre-construction
Appropriate maintenance of all vehicles will be ensured.	Contractor	Duration of contract
All vehicles travelling on public roads will adhere to the specified speed limits and all drivers will be in possession of an appropriate valid driver's license.	Contractor	Duration of contract

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» No traffic incidents involving Eskom personnel or appointed contractors</li> <li>» No complaints resulting from traffic congestion, delays or driver negligence associated with construction of the wind energy facility</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Visual monitoring of traffic control measures to ensure they are effective</li> <li>» A complaints register will be maintained, in which any complaints from the community will be logged. Complaints will be investigated and, if appropriate, acted upon</li> <li>» An incident reporting system will be used to record non-conformances to the EMP</li> </ul>

**OBJECTIVE: Protection of sensitive areas, vegetation and faunal habitats**

The re-commissioning of the gas units at Ankerlig Power Station and the proposed power line within the servitude requires the clearance of vegetation within the development footprint. Impacts on sensitive areas, vegetation and faunal habitats at the construction stage are expected to be mainly as a result of direct permanent loss of vegetation within the development footprint. In order to minimise impacts on flora, fauna and ecological processes, the development footprint and associated disturbance to topsoil should be limited.

<b>Project component/s</b>	<ul style="list-style-type: none"> <li>» Development footprint for relocated gas units</li> <li>» Power line tower footprints</li> <li>» Access roads</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Localised loss of sensitive, protected and/or Red Data plant species</li> <li>» Damage to surrounding areas</li> <li>» Damage to/removal of Red Data plant species and sensitive faunal habitats</li> <li>» Disturbance to plant communities and habitats</li> </ul>
<b>Activity/risk source</b>	<ul style="list-style-type: none"> <li>» Clearing and levelling of development area footprint for relocated gas units</li> <li>» Clearing of tower footprints, servitude centre line and access roads</li> <li>» Traffic to and from site during all phases of construction (i.e. from surveying to rehabilitation of an area)</li> <li>» Site preparation and earthworks</li> <li>» Excavation of foundations</li> <li>» Mobile construction equipment</li> <li>» Dumping or damage by construction equipment outside of demarcated construction areas</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» Minimise areas of impact adjacent to proposed fuel storage area and power line servitude to retain natural vegetation as far as possible</li> <li>» Store construction materials in low impact area</li> <li>» Implement monitoring programme</li> </ul>

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Search and Rescue of certain translocatable, selected succulents and bulbs occurring in the development area is recommended. These are to be translocated to an area approved by the ECO.	Contractor in consultation with Specialist & ECO	Pre-construction
Areas to be cleared shall be clearly marked in the field to eliminate unnecessary clearing and impact on flora and faunal habitats is restricted.	Contractor in consultation with Specialist	Pre-construction, site establishment & duration of contract
Avoid the unnecessary removal of vegetation for the	Contractor	Site

Mitigation: Action/control	Responsibility	Timeframe
transmission power line servitude.		establishment & duration of contract
Limit access to the power line servitude along existing access roads.	Contractor	Site establishment & duration of contract
Minimise the use of herbicides as far as possible. Where herbicides are required to be used, this shall be undertaken by a registered pest control operator in accordance with the relevant legislation.	Contractor	Duration of contract
Unnecessary disturbance to areas outside of servitude and power station site shall be strictly controlled.	Contractor	Duration of contract
Implement monitoring programme	Ecologist, ECO	Construction
Compile rehabilitation programme for areas adjacent to servitude, and implement as soon as possible after construction is completed in an area.	Contractor in consultation with ECO	Construction phase
The weed eradication programme detailed in Appendix C of the approved EMP (September 2007) shall be implemented.	Contractor in consultation with ECO	Duration of contract

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» No disturbance outside of designated work areas.</li> <li>» Minimised clearing of existing/natural vegetation.</li> <li>» Limited impacts on areas of identified and demarcated sensitive habitats/vegetation.</li> <li>» Successful recovery of vegetation in servitudes and other disturbed areas post-construction phase</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Observation and monitoring of vegetation clearing activities by ECO throughout construction phase.</li> <li>» Supervision of all clearing and earthworks.</li> <li>» An incident reporting system must be used to record non-conformances to the EMP.</li> </ul>

**OBJECTIVE:** *To ensure all construction activities/practices/procedures are undertaken with the appropriate level of environmental awareness to minimise environmental risk, in line with the specifications of the EMP*

The environmental specifications are required to be underpinned by a series of Method Statements, within which the Contractors and Service Providers are required to outline how any identified environmental risks will practically be mitigated and managed for the duration of the contract. That is, the Contractor will be required to describe how specified requirements will be achieved through the submission of written Method Statements to the Site Manager (and ECO).

A Method Statement is defined as “a written submission by the Contractor in response to the environmental specification or a request by the Project Manager/Site Manager, setting out the plant, materials, labour and method the Contractor proposes using to conduct an activity, in such detail that the Project Manager/Site Manager is able to assess whether the Contractor's proposal is in accordance with the Specifications and/or will produce results in accordance with the Specifications”. A Method Statement must cover applicable details with regards to:

- » Construction procedures
- » Materials and equipment to be used
- » Getting the equipment to and from site
- » How the equipment/material will be moved while on-site
- » How and where material will be stored
- » The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur
- » Timing and location of activities
- » Compliance/non-compliance with the Specifications, and
- » Any other information deemed necessary by the Project Manager/Site Manager.

The Contractor may not commence the activity covered by the Method Statement until it has been approved by the Site Manager/ECO (or as per the reporting structures in the Ankerlig OCGT Power Station EMP), except in the case of emergency activities and then only with the consent of the Site Manager. Approval of the Method Statement will not absolve the Contractor from their obligations or responsibilities in terms of their contract.



## MANAGEMENT PLAN: CONSTRUCTION OF 132KV POWER LINE

## CHAPTER 6

### 6.1. Overall Goal for Construction of 132kV Power Line

**Overall Goal for Construction:** Undertake the construction phase in a way that:

- » Ensures that construction activities are properly managed in respect of environmental aspects and impacts.
- » Enables the construction activities to be undertaken without significant disruption to other land uses in the area, in particular with regard to noise impacts, farming practices, traffic and road use, and effects on local residents.
- » Minimises the impact on the vegetation and habitats within the area.
- » Minimises the impact on the archaeological and historical value of the area, and where possible adds to the archaeological record of this area.
- » Minimises impacts on birds and terrestrial fauna within the study area.

This addendum to the approved EMP must be read in conjunction with the relevant sections and appendices of the Ankerlig OCGT Power Station EMP (Revision 1 dated September 2008). This addendum relates only to activities associated with the decommissioning and relocation of the Acacia and Port Rex gas turbines to Ankerlig Power Station. Generic environmental specifications and guidelines included within this approved EMP are not repeated here.

### 6.2. Objectives for Construction

In order to meet the goals, the following objectives have been identified, together with necessary actions and monitoring requirements.

***OBJECTIVE: Protection of sensitive areas, vegetation and faunal habitats***

The construction of the proposed power line within the servitude requires the clearance of vegetation within the development footprint. Impacts on sensitive areas, vegetation and faunal habitats at the construction stage are expected to be mainly as a result of direct permanent loss of vegetation within the development footprint. In order to minimise impacts on flora, fauna and ecological processes, the development footprint and associated disturbance to topsoil should be limited.

<b>Project component/s</b>	<ul style="list-style-type: none"> <li>» Power line tower footprints</li> <li>» Access roads</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Localised loss of sensitive, protected and/or Red Data plant species</li> <li>» Damage to surrounding areas</li> <li>» Damage to/removal of Red Data plant species and sensitive faunal habitats</li> <li>» Damage to faunal habitats and impact on faunal life</li> <li>» Disturbance to plant communities and habitats</li> </ul>
<b>Activity/risk source</b>	<ul style="list-style-type: none"> <li>» Clearing of tower footprints, servitude centre line and access roads</li> <li>» Traffic to and from site during all phases of construction (i.e. from surveying to rehabilitation of an area)</li> <li>» Site preparation and earthworks</li> <li>» Excavation of foundations</li> <li>» Mobile construction equipment</li> <li>» Dumping or damage by construction equipment outside of demarcated construction areas</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» Minimise areas of impact adjacent to proposed servitude to retain natural vegetation as far as possible</li> <li>» Store construction materials in low impact area</li> <li>» Implement monitoring programme</li> </ul>

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Areas to be cleared shall be clearly marked in the field to eliminate unnecessary clearing and impact on flora and faunal habitats is restricted.	Contractor in consultation with Specialist	Pre-construction, site establishment & duration of contract
Avoid the unnecessary removal of vegetation for the transmission power line servitude. No bushcutting may occur in the high sensitivity sections of the servitude.	Contractor	Site establishment & duration of contract
Ensure that the power line does not cross any avian habitats of high conservation value and has minimal impact on avian flight paths	Contractor	Pre-construction
Ensure that the power line design accommodates locally observed avian species	Contractor	Pre-construction
Limit access to the power line servitude along existing access roads.	Contractor	Site establishment & duration of contract
Minimise the use of herbicides as far as possible. Where herbicides are required to be used, this shall be undertaken by a registered pest control operator in accordance with the relevant legislation.	Contractor	Duration of contract
Unnecessary disturbance to areas outside of servitude	Contractor	Duration of

Mitigation: Action/control	Responsibility	Timeframe
shall be strictly controlled.		contract
Implement monitoring programme.	Ecologist, ECO	Construction
Compile rehabilitation programme for areas adjacent to servitude, and implement as soon as possible after construction is completed in an area.	Contractor in consultation with ECO	Construction phase
Implement bird guards on all self-supporting towers according to the existing Eskom Guideline in order to prevent birds from perching in high risk areas on the towers directly above live conductors.	Contractor in consultation with Eskom Transmission	Construction phase
The weed eradication programme detailed in Appendix C of the approved EMP (September 2007) shall be implemented.	Contractor in consultation with ECO	Duration of contract

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» No disturbance outside of designated work areas.</li> <li>» Minimised clearing of existing/natural vegetation.</li> <li>» Limited impacts on areas of identified and demarcated sensitive habitats/vegetation.</li> <li>» Successful recovery of vegetation in servitudes and other disturbed areas post-construction phase</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Observation and monitoring of vegetation clearing activities by ECO throughout construction phase.</li> <li>» Supervision of all clearing and earthworks.</li> <li>» Monitoring of disturbance to surrounding habitats due to construction of power lines</li> <li>» An incident reporting system must be used to record non-conformances to the EMP.</li> </ul>

**OBJECTIVE: Protection of sites of heritage value**

Numerous fossil and archaeological sites have been recorded in the broader study area. No specific heritage surveys have been carried out for this project at this stage, as sufficient information was obtainable from existing information.

Heritage sites can be negatively affected by disturbance of the land surface, destruction of significant structures and places as well as any action that will alter the feel and appearance of an historic place or building. Therefore, the construction of the power line could result in moderate impacts to the land surface during the construction phase but permanent changes in terms of visual impacts and changes to the feel of a landscape.

<b>Project component/s</b>	List of project components affecting the objective: » Power line towers » access roads
<b>Potential Impact</b>	» Heritage objects or artefacts found during construction are inappropriately managed or destroyed
<b>Activity/risk source</b>	» Site preparation and earthworks » Excavation of foundations » Construction equipment movement on site
<b>Mitigation: Target/Objective</b>	» To ensure that any heritage objects found on site are recorded and/or treated appropriately and in accordance with the relevant legislation

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Familiarise all staff and contractors with procedures for dealing with heritage objects/sites.	ECO/specialist	Pre-construction
Should any finds be unearthed during construction activity, an archaeologist and Heritage Western Cape should be informed immediately. The relevant contact person at Heritage Western Cape is Ms Celeste Booth (021 483-9685).	ECO	Construction
Project employees and any contract staff should maintain, at all times, a high level of awareness of the possibility of discovering heritage sites.	Eskom/Contractor	Duration of contract
Apply for sampling permits from SAHRA for work on any archaeological sites identified as needing intervention – in other words any archaeological site that will be directly affected by the proposed transmission power lines, substation or access roads.	Eskom/Contractor in consultation with Specialist	Duration of contract
In the event of a find of human remains: 1) leave the remains in place, nothing should be moved 2) Cordon off the area 3) Call Ms Mary Leslie at SAHRA (021 4624509) 4) Contact an archaeologist 5) Once an archaeologist has examined the find, the archaeologist/SAHRA should contact SA Police services and the state pathologist to report human remains 6) If the human remains are found to be a legitimate burial or a pre-colonial burial, an emergency exhumation permit will be issued by SAHRA or HWC 7) If a crime is suspected, a police docket will need to be opened.	Eskom/Contractor in consultation with Specialist	Duration of contract

<b>Performance Indicator</b>	<ul style="list-style-type: none"><li>» No disturbance of heritage sites outside of designated work areas.</li><li>» All heritage items located are dealt with as per the legislative guidelines.</li></ul>
<b>Monitoring</b>	<ul style="list-style-type: none"><li>» Observation of excavation activities by ECO throughout construction phase.</li><li>» Supervision of all clearing and earthworks.</li><li>» Due care taken during earthworks and disturbance of land by all staff and any heritage objects found reported, and appropriate permits obtained from SAHRA prior to the disturbance or destruction of heritage sites.</li><li>» An incident reporting system should be used to record non-conformances to the EMP.</li></ul>

***OBJECTIVE: To ensure all construction activities/practices/procedures are undertaken with the appropriate level of environmental awareness to minimise environmental risk, in line with the specifications of the EMP***

The environmental specifications are required to be underpinned by a series of Method Statements, within which the Contractors and Service Providers are required to outline how any identified environmental risks will practically be mitigated and managed for the duration of the contract. That is, the Contractor will be required to describe how specified requirements will be achieved through the submission of written Method Statements to the Site Manager (and ECO).

A Method Statement is defined as “a written submission by the Contractor in response to the environmental specification or a request by the Project Manager/Site Manager, setting out the plant, materials, labour and method the Contractor proposes using to conduct an activity, in such detail that the Project Manager/Site Manager is able to assess whether the Contractor’s proposal is in accordance with the Specifications and/or will produce results in accordance with the Specifications”. A Method Statement must cover applicable details with regards to:

- » Construction procedures
- » Materials and equipment to be used
- » Getting the equipment to and from site
- » How the equipment/material will be moved while on-site
- » How and where material will be stored
- » The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur
- » Timing and location of activities
- » Compliance/non-compliance with the Specifications, and
- » Any other information deemed necessary by the Project Manager/Site Manager.

The Contractor may not commence the activity covered by the Method Statement until it has been approved by the Site Manager/ECO (or as per the reporting structures in the Ankerlig OCGT Power Station EMP), except in the case of emergency activities and then only with the consent of the Site Manager. Approval of the Method Statement will not absolve the Contractor from their obligations or responsibilities in terms of their contract.

## MANAGEMENT PLAN: OPERATION AND MAINTENANCE

## CHAPTER 7

### 7.1. Overall Goal for Operation

**Overall Goal for Operation:** To ensure that the operation and maintenance of the aero-derivative gas turbines at the Ankerlig Power Station site does not have unforeseen impacts on the environment and to ensure that all impacts are monitored and the necessary corrective action taken in all cases. In order to address this goal, it is necessary to operate the proposed project in a way that:

- » Ensures that operation activities are properly managed in respect of environmental aspects and impacts.
- » Enables operation and maintenance activities to be undertaken without significant disruption to other land uses in the area, in particular with regard to noise impacts, traffic and road use, and effects on local residents.
- » Minimises impacts on birds in the area.

This addendum relates only to activities associated with the operation and maintenance of the aero-derivative gas turbines at the Ankerlig Power Station site. Generic environmental specifications and guidelines applicable to the power station and power line operation and maintenance included within this approved EMP are not repeated here.

### 7.2. Objectives for Operation and Maintenance

In order to meet the goal for operation and maintenance, the following objectives have been identified, together with necessary actions and monitoring requirements.

***OBJECTIVE: Maintain the noise levels around the power station site within acceptable levels and minimise the impact on residential areas and communities***

The results of the noise impact assessment undertaken as part of the EIA indicate that the potential impact of the relocated Acacia and Port Rex gas units on the overall noise levels in the noise-sensitive areas of Atlantis would be of Low significance.

<b>Project component/s</b>	List of project components affecting the objective: <ul style="list-style-type: none"><li>» Aero-derivative gas turbines</li></ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"><li>» Noise from turbines on the site causes a disturbance to local residents, which cannot be mitigated.</li></ul>

<b>Activity/risk source</b>	» Aero-derivative gas turbines
<b>Mitigation: Target/Objective</b>	» To confirm that noise levels generated by the facility are within or below the levels predicted by the noise specialist in the EIA

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Regular maintenance of equipment shall be undertaken throughout the operation of the power station	Eskom	Operation
Training of personnel to adhere to operational procedures that reduce the occurrence and magnitude of individual noisy events.	Eskom	Operation
Maintain similar enclosures to the ones currently utilised at the Acacia units.	Eskom	Operation
Implement the noise management and monitoring plan as per the approved EMP (dated September 2007)	Eskom	Operation

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» The measured noise levels around the boundary of the site to be less than 70 dBA during day-time and 60 dBA during night-time.</li> <li>» The noise levels in Avondale and Protea Park residential areas not to exceed 50 dBA and 45 dBA during daytime and night-time respectively, due to the power station operations.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Annual noise monitoring throughout the operational lifespan on the perimeter of the power station. The closest residential area to the site and at two selected locations outside the perimeter should also be included.</li> <li>» The noise monitoring should be performed in accordance with SANS 10103 and the report submitted to the appropriate authority.</li> </ul>

***OBJECTIVE: Management of dust and emissions to air***

The main air pollution sources identified to be associated with the proposed power station conversion include:

- » The turbine combustion emissions during the normal operation phase.
- » The turbine combustion emissions during start-up and upset conditions.

<b>Project component/s</b>	Project components affecting the objective: <ul style="list-style-type: none"> <li>» Acacia and Port Rex gas units</li> </ul>
<b>Potential Impact</b>	» Emissions from gas unit stacks
<b>Activities/risk</b>	» Operation of the power station



<b>sources</b>	
<b>Mitigation: Target/Objective</b>	» To ensure emissions are minimised, where possible, for the duration of the operation phase

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Utilise low sulphur diesel (as is currently being utilised at Ankerlig Power Station) as a fuel source	Eskom	Operation
Introduce nitrogen dioxide emission controls	Eskom	Operation
Implement the air pollution management plan as per the approved EMP (dated September 2007)	Eskom	Operation

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» The measured hourly and annual nitrogen dioxide levels due to the power station's operations at local communities around the power station to be in compliance with South African ambient NO2 air quality standards</li> <li>» No complaints from affected residents or community regarding emissions</li> </ul>
<b>Monitoring</b>	<p>Monitoring will be undertaken to ensure emissions are not exceeding the prescribed levels via the following methods:</p> <ul style="list-style-type: none"> <li>» In-stack monitoring of emissions</li> <li>» Monitoring of nitrogen oxides at local communities</li> <li>» A complaints register will be maintained, in which any complaints from residents/the community will be logged. Complaints will be investigated and, where appropriate, acted upon.</li> <li>» An incident reporting system will be used to record non-conformances to the EMP.</li> </ul>

***OBJECTIVE: Protection of vegetation and faunal habitats***

Indirect impacts on vegetation during operation and maintenance activities could result from maintenance activities and the movement of people and vehicles along the power line servitude.

<b>Project component/s</b>	<p>List of project components affecting the objective:</p> <ul style="list-style-type: none"> <li>» Power line servitudes and associated access roads</li> </ul>
<b>Potential Impact</b>	» Disturbance to or loss of vegetation and/or habitats
<b>Activity/risk source</b>	» Movement of employee and visitor vehicles within and around site
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» To minimise impacts on flora and faunal habitats</li> <li>» To ensure and encourage plant regrowth in areas of post-construction rehabilitation</li> </ul>

Mitigation: Action/control	Responsibility	Timeframe
Vehicle movements shall be restricted to designated roadways	Eskom	Operation
No new roads shall be created	Eskom	Operation
Existing roads shall be maintained to ensure limited erosion and impact on areas adjacent to roadways.	Eskom	Operation
During maintenance activities, unnecessary disturbance to habitats shall be strictly controlled. Avoiding any sensitive habitats with maintenance vehicles must be ensured.	Contractor in consultation with Specialist	Duration of contract
No bushcutting may occur within the High and Medium sensitivity sections of the servitudes (as detailed in the EIA Report). If it is proven essential, the maximum frequency permitted should be once every ten years.	Eskom	Operation
Implement the weed eradication programme as detailed in the approved EMP (dated September 2007)	Eskom	Operation
Ongoing, annual alien plant management must be undertaken in the High and Medium sensitivity sections of the servitudes (as identified in the EIA Report). Methodology used must comply with the Department of Water Affairs (DWA) methodology for control of <i>Acacia saligna</i> and <i>Acacia cyclops</i> . Key elements include: alien clearing must be undertaken by well trained teams using the right equipment; all stems must be cut by hand (not heavy machinery); all cut stumps must immediately (within 5 minutes) be painted with a suitable herbicide that contains a visible dye (in order to prevent resprouting, and to ensure that all stems are painted); no spraying of herbicide; cut stems must be neatly stacked at the outside edges of the servitudes, or preferably removed from the servitudes to an approved organic waste dump site.	Eskom	Operation

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» No further disturbance to vegetation</li> <li>» Continued improvement of rehabilitation efforts</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Observation of vegetation on-site by Site Manager</li> <li>» Annual monitoring by an independent consultant to ensure that alien vegetation is being cleared appropriately from the High and Medium sensitivity areas (as identified in the EIA Report), and to ensure that these areas are not being bushcut more than once every ten years.</li> </ul>

**OBJECTIVE: Protection of avifauna**

Bird interactions with the power lines can be anticipated during the operation phase of the power lines. These are, however, well researched in the South African context (through the EWT and Eskom partnership). The main impacts expected are as a result of collisions with the earth wire and disturbance of bird species in the area.

As a result of long-term monitoring, Eskom are in a position to make use of 'bird-friendly' towers and conductor configurations for their power lines.

A number of mechanisms exist through which birds are able to cause electrical faults. These include:

- » Bird streamer induced faulting, whereby the fault is caused by the bird releasing a "streamer" of faeces which can constitute an air gap intrusion between the conductor and the earthed structure.
- » Bird pollution, whereby a flashover occurs when an insulator string gets coated with pollutant, which compromises the insulation properties of the string.
- » Bird nests, which may cause faults through nest material protruding and constituting an air gap intrusion

<b>Project component/s</b>	List of project components affecting the objective: » power line
<b>Potential Impact</b>	» Loss of birds as a result of collision with the power line earth wire » Disturbance to bird species in the area as a result of maintenance activities » Impact of birds on quality of supply
<b>Activity/risk source</b>	» Overhead power line
<b>Mitigation: Target/Objective</b>	» Ensure bird-friendly towers are installed and maintained.

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Marking of the earth wires shall be undertaken on the high risk sections of the power line with an appropriate, Eskom approved marking device according the Eskom guidelines.	Eskom / specialist	Operation/ maintenance
Bird Guards shall be installed on all self-supporting towers according to the existing Eskom guidelines in order to prevent birds from perching in high-risk areas on the towers directly above live conductors.	Eskom / specialist	Operation/ maintenance
During maintenance activities, unnecessary	Contractor in	Duration of

Mitigation: Action/control	Responsibility	Timeframe
disturbance to habitats shall be strictly controlled. Avoiding any sensitive habitats with maintenance vehicles must be ensured.	consultation with Specialist	contract

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» No additional disturbance to avifaunal populations along the length of the power line route</li> <li>» Continued improvement of avifaunal protection efforts</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Observation of avifaunal populations and incidence of injuries/death from collisions with the power line</li> <li>» Regular inspections to monitor casualties from collisions - delegate a suitable on-site monitor to assess avian mortality associated with the power lines.</li> </ul>

**OBJECTIVE: Minimisation of visual impacts**

The primary area of potential visual impact of the relocated gas units would be contained within the Atlantis industrial area. The units would be visible from a section of the Dassenberg Road (R307), north of the power station site. The gas turbine units, although visible, will not be viewed in isolation. The much bulkier and imposing OCGT units, fuel storage tanks and the HV Yard will also fill the frame of view, thereby mitigating the individual visual impact of the proposed gas turbine units further. The visual impact associated with the 132kV power line will be entirely contained within the Atlantis Industrial area.

<b>Project component/s</b>	List of project components affecting the objective: <ul style="list-style-type: none"> <li>» Relocated gas units (~14 m high stacks)</li> <li>» Additional fuel storage tank</li> <li>» 132 kV power line</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Enhanced visual intrusion</li> </ul>
<b>Activity/risk source</b>	<ul style="list-style-type: none"> <li>» Relocated gas unit stacks (~14 m in height) and associated lighting</li> <li>» Power line</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» To minimise potential for visual impact</li> <li>» Minimise contrast with surrounding environment and visibility of the turbines to humans</li> </ul>

Mitigation: Action/control	Responsibility	Timeframe
Ensure careful planning and sensitive placement of any additional light fixtures, and ensure the fitment of covers and shields designed to contain, rather than spread the light.	Eskom/ lighting engineer	Erection and maintenance

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Ensure timely maintenance of the gas units, ancillary infrastructure and the general surrounds of the property (gardens, access roads, etc.) in order to prevent the visual impact of degradation and perceived poor management	Eskom	Operation and maintenance
Natural hues that compliment the natural environment (such as is currently the case) must be used to soften the general appearance of the power plant.	Eskom	Erection and maintenance

<b>Performance Indicator</b>	» Minimised visual intrusion on surrounding areas
<b>Monitoring</b>	» Ensure that adequate safety lighting is installed before construction is completed and are functional at all times

**APPENDIX A:  
ENVIRONMENTAL AUTHORISATION**

**APPENDIX B:  
ANKERLIG OCGT POWER STATION EMP (REVISION 1),  
SEPTEMBER 2008**

**APPENDIX C:  
FINAL OPERATIONAL EMP FOR THE ANKERLIG OCGT POWER  
STATION (JANUARY 2009)**