PROJECT DETAILS

DEAT Reference No. : 12/12/20/1155

Title : Environmental Impact Assessment Process
Final Environmental Impact Assessment (EIA) Report: Proposed Decommissioning and Relocation of the Three Gas Turbine Units at Acacia Power Station (Near Goodwood, Western Cape) and One Gas Turbine Unit at Port Rex Power Station (Near East London, Eastern Cape) to the Existing Ankerlig Power Station Site, in Atlantis Industria, Western Cape

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Client : Eskom Holdings Limited (Eskom Generation)

Report Status : Final EIA Report for authority review

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PURPOSE OF THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT

The proposed project involves the following activities:

» Decommissioning and relocation of the three existing aero derivative gas turbine units[1] 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. This unit may or may not be relocated back to Port Rex at a later stage, depending on Eskom's requirements at the time.
» Turning-in of the existing Koeberg – Dassenberg 132 kV line into a new 132 kV High Voltage Yard (HV Yard) to transmit the power generated by these relocated units to the Koeberg Power Station.

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 Koeberg and Acacia in order to cater for N-1-1 contingency conditions as required by the Grid Code 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 at 400kV but has been operated at 132kV. This power line has been identified as the preferred option to establish the second Acacia – Koeberg 400kV line[2]. 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 Acacia aero derivative gas turbine units 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

[1] 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.

[2] This 400kV power line does not form part of the current process and would be considered as part of a separate EIA process, if required.

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 dedicate 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 high voltage (HV) yard adjacent to the now-to-be extended substation (HV 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.

Eskom has appointed Savannah Environmental as an independent environmental assessment practitioner to undertake the Environmental Impact Assessment (EIA). The EIA process has been undertaken in accordance with the requirements of the National Environmental Management Act (NEMA; Act No. 107 of 1998).

The EIA Report consists of the following sections:

Chapter 1 provides background to the proposed project and the EIA process.
Chapter 2 describes the components of the proposed project (project scope).
Chapter 3 outlines the process which was followed during the Scoping Phase of the EIA process.
Chapter 4 describes the existing biophysical and socio-economic environment.
Chapter 5 presents the evaluation of environmental impacts associated with the proposed project.
Chapter 6 presents the conclusions and recommendations of the EIA and an Impact Statement.

The Scoping Phase of the EIA process identified potential issues associated with the proposed project, and defined the extent of the studies required within the EIA Phase. The EIA Phase addresses those identified potential environmental impacts and benefits (direct, indirect and cumulative impacts) associated with all phases of the project including design, construction and operation, and recommends appropriate mitigation measures for potentially significant environmental impacts. The EIA report aims to provide the environmental authorities with sufficient information to make an informed decision regarding the proposed project.

The release of a draft EIA Report provided stakeholders with an opportunity to verify that the issues they raised through the EIA process were captured and

adequately considered. This final EIA Report incorporates all issues and responses raised during the public review of the draft EIA Report prior to submission to the National Department of Environmental Affairs and Tourism (DEAT), the decision-making authority for the project.

PUBLIC REVIEW OF THE DRAFT EIA REPORT

The Draft EIA Report was made available for public review at the following public places in the project area from **10 October to 9 November 2008**:

» Wesfleur Library
» Avondale Library
» Melkbosstrand Library
» Edgemead Library
» East London central Library

The report was also available on:
» www.eskom.co.za/eia
» www.savannahSA.com

Comments were requested as written submission via fax, post or e-mail.

STAKEHOLDER MEETING

In order to facilitate comments on the draft EIA Report, a stakeholder meeting was held during the review period. All interested and affected parties were invited to attend:

STAKEHOLDER WORKSHOP
DATE: Tuesday, 21 October 2008
TIME: 11h00
VENUE: Koeberg Visitor's Centre

The aim of this meeting was to provide feedback of the findings of the EIA process undertaken, and to invite comment on the proposed project.

SUMMARY

Background and Project Overview

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 Koeberg and Acacia in order to cater for N-1-1 contingency conditions as required by the Grid Code 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 at 400kV but has been operated at 132kV. This power line has been identified as the preferred option to establish the second Acacia – Koeberg 400kV line[3]. 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 Acacia aero derivative gas turbine units[4] 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 dedicate 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) 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:

[3] The construction and operation of this 400kV power line does not form part of the current process and would be considered as part of a separate EIA process, if required.

[4] 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.

» Decommissioning and relocation of the three existing aero derivative gas turbine units[5] 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. This unit may or may not be relocated back to Port Rex at a later stage, depending on Eskom's requirements at the time.
» Turning-in of the existing Koeberg – Dassenberg 132 kV line into a new 132 kV High Voltage Yard (HV Yard) to transmit the power generated by these relocated units to the Koeberg Power Station.

Environmental Impact Assessment

The proposed decommissioning and relocation of the gas units and the construction of the 132kV power line linking into the Dassenberg-Koeberg line is subject to the requirements of the Environmental Impact Assessment Regulations (EIA Regulations) published in Government Notice (GN) 28753 of 21 April 2006, in terms of Section 24(5) of the National Environmental Management Act (NEMA, No 107 of 1998). In terms of sections 24 and 24D of NEMA, as read with GNs R385 (Regulations 27–36) and R387, a Scoping and EIA are required to be undertaken for this proposed project.

The National Department of Environmental Affairs and Tourism (DEAT) is the competent authority for this project as Eskom is a statutory body. An application for authorisation has been accepted by DEAT (under Application Reference number **12/12/20/1155**). As the project falls within the Western Cape and Eastern Cape Provinces, the Western Cape Department of Environmental Affairs & Development Planning (DEA&DP) and the Eastern Cape Department of Economic Development & Environmental Affairs (DEDEA) will act as a commenting authority and will support DEAT in the decision-making process.

The Scoping Study, which commenced in March 2008, provided interested and affected parties (I&APs) with the opportunity to receive information regarding the proposed project, participate in the process and raise issues of concern.

The Scoping Report aimed at detailing the nature and extent of the proposed project, identifying

[5] 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.

potential issues associated with the proposed project, and defining the extent of studies required within the EIA. This was achieved through an evaluation of the proposed project, involving the project proponent, specialist consultants, and a consultation process with key stakeholders that included both relevant government authorities and interested and affected parties (I&APs). In accordance with the requirements of the EIA Regulations, feasible project-specific alternatives (including the "do nothing" option) were identified for consideration within the EIA process.

The draft Scoping Report compiled was made available at public places for I&AP review and comment. All the comments, concerns and suggestions received during the Scoping Phase and the draft report review period were included in the final Scoping Report and Plan of Study for EIA. The Scoping Report was submitted to DEAT, DEA&DP and DEDEA in July 2008. The Final Scoping Report was accepted by DEAT, as the competent Authority. In terms of this acceptance, an EIA was required to be undertaken for the proposed project.

The EIA Phase addresses potential environmental impacts and benefits (direct, indirect and cumulative impacts) associated with all phases of the project including design, construction, operation and decommissioning, and aims to provide the environmental authorities with sufficient information to make an informed decision regarding the proposed project.

Comprehensive public participation process was undertaken in accordance with Regulation 56 of GN No R385 of 2006 during the Scoping phase of this EIA process. This public participation process comprised the following:

» **Notification of the EIA Process** in local, regional and national newspapers and on site, as well as through written notification to identified stakeholders and affected landowners
» **Identification and registration** of I&APs and key stakeholders.
» Compilation and distribution of a **Background Information Document** (BID) to all identified I&APs and key stakeholders
» **On-going consultation** with identified I&APs and stakeholders
» Compilation and maintenance of a **register** containing the names and addresses of all identified I&APs and key stakeholders
» Preparation of an **Issues and Response Report** detailing key issues raised by I&APs as part of the EIA Process.

Conclusions and Recommendations drawn from the Assessment of the Proposed Decommissioning and Relocation of the gas units from the Acacia and Port Rex Power Stations to the Ankerlig Power Station site

In general, impacts associated with the decommissioning of the gas units

at both the Acacia and Port Rex power station sites are expected to be localised in the short-term. The power station units currently have 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 these existing impacts 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.

The decommissioning of one of the units at the Port Rex Power Station site will reduce the existing impacts 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.

Once decommissioned, the existing gas units from the Acacia and Port Rex power station sites will be relocated to the existing Ankerlig Power Station site near Atlantis where they will be re-commissioned. 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 and re-commissioning of the units are expected to occur during both the construction and operational phases. New impact sources associated with the relocation and re-commissioning of these units are expected to be cumulative at a local level and would mainly include:

» **Air quality impacts** associated with the construction phase (dust) and the operational phase (emissions from the gas units). Impacts associated with the construction phase are expected to be restricted to the power station site and of **low significance**. The relocation of the Acacia and Port Rex units will have a high impact on the existing air quality of the area. The introduction of mitigation measures in the form of utilisation of diesel as a fuel source instead of kerosene (as is currently the case for the Ankerlig Power Station units) will reduce the impact to one of **moderate significance**.

» **Noise impacts** associated with the gas units. The relocation of the Acacia and Port Rex Power Station units will have only a local impact around the north-western boundary when compared to the open cycle levels, increasing the noise levels by 3 dBA. The Acacia and Port Rex units will not have any significant cumulative effect on the noise-sensitive receptors of Atlantis, since the increase above the closed cycle noise levels in the Avondale and Protea Park

areas will be below 0.3 dBA. The cumulative impact of the proposed combined cycle units can potentially have a significant effect on the existing noise levels around the power station site. The introduction of substantial mitigation measures, however, can reduce these levels to the ones generated by only the open cycle units. The overall noise impact due to the relocation of the Acacia and Port Rex units, assuming the same enclosures will be utilised and taking into consideration the resulting noise levels in the noise-sensitive area of Atlantis, was found to be **Low**.

» **Visual impacts** as a result of the additional gas unit infrastructure and 132kV HV yard on the site. The potential visual impacts will be additional to existing visual impacts and is expected to be of **moderate significance**. The envisaged visual impact of the four aero derivative gas turbine units are not as significant as would be the case if this had been a "greenfields" development site.

» **Ecological impacts** at a localised level as a result of the relocated gas units. The ecology of the power station site has been largely transformed through the construction of the existing Ankerlig Power Station. Small portions of vegetation do, however, still exist in areas not directly impacted by construction, such as the area proposed for the establishment of the gas units from the Acacia and Port Rex power station sites adjacent to Neil Hare Road. The primary negative impact is a direct, permanent loss of natural vegetation. This impact cannot be avoided, and can only be mitigated by a biodiversity offset. Potential impacts are expected to be of **moderate to low** significance without mitigation.

» **Impacts on the social environment**. Potential social impacts on the population of Atlantis and surrounding areas can be considered cumulative to those experienced as result of the existing OCGT units, additional units currently under construction, and the planned conversion of these units to CCGT units. These include the possibility of limited positive impacts of possible casual labour used during construction, and the possibility of increased social investment, and potential negative impacts on 'sense of place' resulting from the perception of the area being used as an electricity generation hub, without sufficient benefits accruing to the host community of Atlantis.

While the relocation of units from Acacia and Port Rex is considered the preferred social alternative from a broader social perspective, it is important that cumulative impacts on the receiving community of Atlantis be considered, and

appropriate mitigation applied. This can most effectively be done by maximising social benefit through an increased focus on social investment in the area.

Conclusions and Recommendations drawn from the Assessment and Comparison of the Proposed Power Line Alternatives

Two technically feasible alternative power line alignment corridors (approximately 500 m in width) were assessed within the EIA phase of the process. Potential impacts associated with the proposed power line are expected to occur during the construction and operational phases, and have been identified through the 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 are typically at the site scale, and are expected to be of **low significance** due to the largely disturbed nature of the vegetation and habitats in the area.
» **Impacts on avifauna** as a result of collisions with the earthwire, electrocution and disturbance of habitats within the power line servitude. Impacts are expected to be of **low to no significance** due to the power line structure to be used (which poses little threat of collision and electrocution), as well as the largely disturbed nature of the environment.
» **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 are expected to be of **low significance** due to the location of the proposed power line within an industrial area and in close proximity to other power line infrastructure.
» **Impacts on the social environment** as a result of the creation of employment opportunities, impacts on land use, and impacts on sense of place. Impacts are expected to be both positive and negative, and of **low significance**.

From the assessment of the alternative power line alternatives, **Option 1** is considered to be the alternative which would result in the lower impact on the environment. Both options are, however, considered to be feasible from an environmental perspective.

Overall Conclusion (Impact Statement)

The findings of the specialist studies undertaken within this EIA to assess both the benefits and potential negative impacts anticipated as a

result of the proposed project conclude that:

» There are no environmental fatal flaws that should prevent the proposed project from proceeding on the identified site.
» From the assessment of the alternative power line alternatives, **Option 1** is considered to be the alternative which would result in the lower impact on the environment. Both options are, however, considered to be feasible from an environmental perspective.
» The significance levels of the majority of identified negative impacts can be minimised by implementing the recommended mitigation measures.

Overall Recommendation

Based on the nature and extent of the proposed project, the local level of disturbance predicted, the findings of the EIA, and the understanding of the significance level of potential environmental impacts, it is the opinion of the EIA project team that the application for the proposed decommissioning, relocation and re-commissioning of three aero-derivative gas units from Acacia Power Station and one aero-derivative gas units from Port Rex Power Station to the Ankerlig Power Station, and the associated 132kV power line be authorised by DEAT.

The following conditions of this recommendation must be included within the Environmental Authorisation if approved by DEAT:

» All mitigation measures detailed within the EIA report and the specialist reports must be implemented.
» The draft Environmental Management Plan (EMP) as contained within this report should form part of the contract with the Contractors appointed to undertake the decommissioning, relocation and re-commissioning activities associated with the project, and will be used to ensure compliance with environmental specifications and management measures. The implementation of this EMP for all life cycle phases of the proposed project is considered to be key in achieving the appropriate environmental management standards as detailed for this project.
» Applications for all other relevant and required permits required to be obtained by Eskom must be submitted to the relevant regulating authorities. This includes permits for the transporting of all components (abnormal loads) to site, disturbance to heritage sites, disturbance of protected vegetation, and disturbance to any riparian vegetation or wetlands.
» During construction, unnecessary disturbance to habitats should be strictly controlled and the footprint of the impact should be kept to a minimum.

- The need for on-site offsets or enhanced ecological management should be discussed with the authorities, should this be deemed necessary
- The process of communication and consultation with the community representatives must be maintained after the closure of this EIA process, and, in particular, during the construction phase associated with the proposed project.

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APPENDICES

ABBREVIATIONS AND ACRONYMS

CCGT	Combined Cycle Gas Turbine
CSI	Eskom's corporate social investment
DEA&DP	Western Cape Department of Environmental Affairs and Development Planning
DEDEA	Eastern Cape Department of Economic Development and Environmental Affairs
DEAT	National Department of Environmental Affairs and Tourism
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ESDEF	Eskom Development Foundation
Eskom	Eskom Holdings Limited
GG	Government Gazette
GN	Government Notice
I&AP	Interested and Affected Party
IPS	Interconnected power system
kV	Kilovolt
LED	Local Economic Development
MW	Mega Watt
NEMA	National Environmental Management Act (No 107 of 1998)
NERSA	National Energy Regulator of South Africa
NO_2	Nitrogen dioxide
NNR	National Nuclear Regulator
SAHRA	South African Heritage Resources Agency
OCGT	Open Cycle Gas Turbine
SIA	Social Impact Assessment
TS	Transmission System
VOCs	Volatile organic compounds

DEFINITIONS AND TERMINOLOGY

Aero derivative gas turbines: 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.

Alternatives: Alternatives are different means of meeting the general purpose and need of a proposed activity. Alternatives may include location or site alternatives, activity alternatives, process or technology alternatives, temporal alternatives or the 'do nothing' alternative.

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.

Do nothing alternative: The 'do nothing' alternative is the option of not undertaking the proposed activity or any of its alternatives. The 'do nothing' alternative also provides the baseline against which the impacts of other alternatives should be compared.

Environment: the surroundings within which humans exist and that are made up of:

i. the land, water and atmosphere of the earth;
ii. micro-organisms, plant and animal life;
iii. any part or combination of (i) and (ii) and the interrelationships among and between them; and
iv. the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental Impact: An action or series of actions that have an effect on the environment.

Environmental impact assessment: Environmental Impact Assessment (EIA), as defined in the NEMA EIA Regulations and in relation to an application to which scoping must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of that application.

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.

Environmental management plan: A plan that organises and co-ordinates mitigation, rehabilitation and monitoring measures in order to guide the design, construction and implementation of a proposal and its ongoing maintenance after implementation.

Grid Code: 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 the following:

» That accountabilities of all parties are defined for the provision of open access to the TS
» That minimum technical requirements are defined for customers connecting to the TS
» That minimum technical requirements are defined for service providers
» That the System Operator's obligations are defined to ensure the integrity of the IPS
» That obligations of participants are defined for the safe and efficient operation of the TS
» That the relevant information is made available to and by the industry participants
» That the major technical cost drivers and pricing principles of the service providers are transparent The responsibility of the service providers under this Grid Code shall be:
    * to show no interest in whose product is being transported
    * to ensure that investments are made within the requirements of the Grid Code
    * to provide open access, on agreed standard terms, to all parties wishing to connect to or use the TS.

The Grid Code defines what is understood by non-discrimination through the definition of consistent and transparent principles, criteria and procedures.

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.

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.

INTRODUCTION CHAPTER 1

Eskom Holdings Limited are proposing the following activities:

» Decommissioning and relocation of the three existing aero derivative gas turbine units[6] 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. This unit may or may not be relocated back to Port Rex at a later stage, depending on Eskom's requirements at the time.
» Turning-in of the existing Koeberg – Dassenberg 132 kV line into a new 132 kV High Voltage Yard (HV Yard) to transmit the power generated by these relocated units to the Koeberg Power Station.

The nature and extent of these activities, as well as potential environmental impacts associated with the construction and operation of a project of this nature is assessed in this Environmental Impact Assessment (EIA) Report.

1.1. Project Overview and Purpose

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[7] as required by the Grid Code[8] for stations with an output larger than 1000 MW (in this case, both the Koeberg and Ankerlig power stations).

[6] 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.

[7] 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.

[8] 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

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[9]. 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[10] 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. The unit from Port Rex Power Station may or may not be returned to Port Rex, depending on Eskom's requirements at the time.

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 high voltage (HV) yard adjacent to the now-to-be extended substation (HV 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 nature and extent of the decommissioning and relocation of the Acacia and Port Rex units, and the construction of the 132kV HV yard and power line, as well as potential environmental impacts associated with the construction and operation of a project of this nature is assessed in this Environmental Impact Assessment (EIA) Report.

[9] The construction and operation of this 400kV power line does not form part of the current process and would be considered as part of a separate EIA process, if required.

[10] 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.

1.2. Requirement for an Environmental Impact Assessment Process

The proposed decommissioning and relocation of the Acacia and Port Rex units and the construction of the 132kV HV yard and power line are subject to the requirements of the EIA Regulations published in terms of Section 24(5) of the National Environmental Management Act (NEMA, No 107 of 1998). This section provides a brief overview of EIA Regulations and their application to this project.

NEMA is national legislation that provides for the authorisation of certain controlled activities known as "listed activities". In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed and reported on to the competent authority (the decision-maker) charged by NEMA with granting of the relevant environmental authorisation. The National Department of Environmental Affairs and Tourism (DEAT) is the competent authority for this project as Eskom is a statutory body. An application for authorisation has been accepted by DEAT (under **Application Reference number 12/12/20/1155**). As the project falls within the Western Cape and Eastern Cape Provinces, the Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) and the Eastern Cape Department of Economic Development and Environmental Affairs (DEDEA) will act as a commenting authority and will support DEAT in the decision-making process.

The need to comply with the requirements of the EIA Regulations ensures that decision-makers are provided the opportunity to consider the potential environmental impacts of a project early in the project development process, and assess if environmental impacts can be avoided, minimised or mitigated to acceptable levels. Comprehensive, independent environmental studies are required to be undertaken in accordance with the EIA Regulations to provide the competent authority with sufficient information in order for an informed decision to be taken regarding the project. Eskom appointed Savannah Environmental (Pty) Ltd to conduct the independent EIA process for the proposed project.

An EIA is also an effective planning and decision-making tool for the project proponent. It allows the environmental consequences resulting from a technical facility during its establishment and its operation to be identified and appropriately managed. It provides the opportunity for the developer to be forewarned of potential environmental issues, and allows for resolution of the issue(s) reported on in the Scoping and EIA reports as well as dialogue with affected parties.

In terms of sections 24 and 24D of NEMA, as read with Government Notices (GN) R385 (Regulations 27–36) and R387, a Scoping and EIA are required to be

undertaken for this proposed project as it includes the following activities listed in terms of GN R386 and R387 (GG No 28753 of 21 April 2006):

No & date of relevant notice	Activity No (in terms of relevant Regulation / notice)	Description of listed activity
Government Notice R387 (21 April 2006)	1(a)	The construction of facilities or infrastructure, including associated structures or infrastructure, for the generation of electricity where (i) the electricity output is 20 megawatts or more; or (ii) the elements of the facility cover a combined area in excess of 1 hectare
Government Notice R387 (21 April 2006)	1(c)	The above-ground storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of 1000 cubic meters or more at any one location or site including the storage of one or more dangerous goods, in a tank farm
Government Notice R387 (21 April 2006)	1(l)	The construction of facilities or infrastructure, including associated structures or infrastructure for the transmission and distribution of above ground electricity with a capacity of 120 kilovolts or more
Government Notice R386 (21 April 2006)	7	The above ground storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 cubic metres but less than 1 000 cubic metres at any one location or site.
Government Notice R386 (21 April 2006)	14	The construction of masts of any material of type and of any height, including those used for telecommunications broadcasting and radio transmission, but excluding (a) masts of 15m and lower exclusively used by (i) radio amateurs; or (ii) for lightening purposes (b) flagpoles; and (c) lightening conductor poles
Government Notice R386 (21 April 2006)	23 (a)	The decommissioning of existing facilities or infrastructure, other than facilities or infrastructure that commenced under an environmental authorisation issued in terms of the Environmental Impact Assessment Regulations, 2006 made under section 24(5) of the Act and published in Government Notice No. R. 385 of 2006, for electricity generation
Government Notice R386 (21 April 2006)	24 (a)	The recommissioning or use of any facility or infrastructure, excluding any facility or infrastructure that commenced under an environmental authorisation issued in terms of the Environmental Impact Assessment Regulations, 2006 made under

No & date of relevant notice	Activity No (in terms of relevant Regulation / notice)	Description of listed activity
		section 24(5) of the Act and published in Government Notice No. R. 385 of 2006, after a period of two years from closure or temporary closure, for electricity generation
Government Notice R386 (21 April 2006)	25	The expansion of or changes to existing facilities for any process or activity, which requires an amendment of an existing permit or license or a new permit or license in terms of legislation governing the release of emissions, pollution, effluent.

This report documents the assessment of the potential environmental impacts of the proposed decommissioning, relocation and operational phases of the proposed project. This EIA study forms part of the EIA process and was conducted in accordance with the requirements of the EIA Regulations in terms of Section 24(5) of NEMA (Act No 107 of 1998).

1.3. Objectives of the Environmental Impact Assessment Process

The Scoping Phase of the EIA process identified potential issues associated with the proposed project, and defined the extent of the studies required within the EIA Phase. This was achieved through an evaluation of the proposed project, involving the project proponent, specialists with experience in undertaking EIAs for similar projects, and a public consultation process with key stakeholders that included both government authorities and interested and affected parties (I&APs). The EIA addresses those identified potential environmental impacts and benefits (direct, indirect and cumulative impacts) associated with all phases of the project including design, construction, operation and decommissioning, and recommends appropriate mitigation measures for potentially significant environmental impacts. The EIA report aims to provide the environmental authorities with sufficient information to make an informed decision regarding the proposed project.

The release of a draft EIA Report provides stakeholders with an opportunity to verify that the issues they have raised through the EIA process have been captured and adequately considered. The final EIA Report will incorporate all issues and responses raised during the public review of the draft EIA Report prior to submission to DEAT.

The EIA Report consists of the following sections:

Chapter 1 provides background to the proposed project and the EIA process.

Chapter 2 describes the components of the proposed project (project scope).
Chapter 3 outlines the process which was followed during the Scoping Phase of the EIA process.
Chapter 4 describes the existing biophysical and socio-economic environment.
Chapter 5 presents the evaluation of environmental impacts associated with the proposed project.
Chapter 6 presents the conclusions and recommendations of the EIA and an Impact Statement.

1.4. Details of Environmental Assessment Practitioner and Expertise to conduct the Scoping and EIA

Savannah Environmental was contracted by Eskom as an independent environmental assessment practitioner to undertake an EIA for the proposed project, as required by the NEMA EIA Regulations. Neither Savannah Environmental, nor any its specialist sub-consultants on this project are subsidiaries of or affiliated to Eskom. Furthermore, Savannah Environmental does not have any interests in secondary developments that may arise out of the authorisation of the proposed project.

The Savannah Environmental project team have more than ten (10) years experience in environmental assessment and environmental management, and have been actively involved in undertaking environmental studies for a wide variety of projects throughout South Africa. Strong competencies have been developed in project management of environmental EIA processes, as well as strategic environmental assessment and compliance advice, and the identification of environmental management solutions and mitigation/risk minimising measures.

Jo-Anne Thomas and Karen Jodas, the principal authors of this EIA Report, are both registered Professional Natural Scientists (in the practice of environmental science) with the South African Council for Natural Scientific Professions. They have gained extensive knowledge and experience on potential environmental impacts associated with electricity generation projects through their involvement in related EIA processes over the past ten (10) years. They have successfully managed and undertaken EIA processes for other power generation projects for Eskom throughout South Africa. Curricula vitae for the Savannah Environmental project team consultants are included in Appendix A.

In order to adequately identify and assess potential environmental impacts, Savannah Environmental has appointed several specialist consultants to conduct specialist studies, as required. Details of these specialist studies are included in Chapter 3. The curricula vitae for the EIA specialist consultants are also included in Appendix A.

The proposed project involves the following activities:

» Decommissioning and relocation of the three existing aero derivative gas turbine units[11] 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. This unit may or may not be relocated back to Port Rex at a later stage, depending on Eskom's requirements at the time.
» Turning-in of the existing Koeberg – Dassenberg 132 kV line into a new 132 kV High Voltage Yard (HV Yard) to transmit the power generated by these relocated units to the Koeberg Power Station.

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, but could also be operated on diesel.

This chapter provides details regarding the scope of the proposed project, including all required elements of the project and necessary steps for the project to proceed. The scope of project includes the decommissioning, relocation and operational activities associated with the proposed project at the existing Acacia Power Station site in Goodwood, the Port Rex Power Station site in East London and the Ankerlig Power Station site in Atlantis, as well as the construction and operation of the associated 132kV power line.

2.1. Decommissioning and Relocation of the Acacia and Port Rex Gas Units

The transmission integration of the Ankerlig OCGT power plant at Atlantis consists of two 400kV power lines between Ankerlig and Koeberg, and two 400kV lines between Ankerlig and Aurora Substation. These lines have sufficient capacity to

[11] 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.

evacuate the power generated by the nine OCGT units at Ankerlig (i.e. the 4 existing units and the 5 units currently being constructed). An additional 400kV power line is proposed to be constructed between the Ankerlig Power Station and the Omega Substation by 2010 in order to evacuate the additional power to be generated by the converted OCGT units[12].

Transmission network studies concluded by Eskom have shown that an increase of the power output from the Ankerlig Power Station will result in an increase of the power flow from Koeberg to Muldersvlei Substation. This results in an overload condition on the existing 400kV Koeberg – Acacia line under certain network contingencies[13]. As such, the Koeberg Nuclear Power Station will not comply with the N-2 grid code requirement for power stations with an output larger that 1000 MW[14].

These constraints can be resolved by re-deploying a 400kV-designed line between Koeberg and Acacia that is currently operated at 132kV (which provides a dedicated back-up supply to Koeberg Nuclear Power Station in terms of the requirements of the National Nuclear Regulator) as a 400kV line[15]. This, however, means that an alternative arrangement must be implemented for the dedicated supply to Koeberg. The following options are considered to facilitate this:

1. The gas turbines installed at Acacia Power Station can be relocated to the Ankerlig Power Station site and connected to the Koeberg Nuclear Power Station by turning the existing Koeberg–Dassenberg 132kV line into Ankerlig.
2. The construction of a new 132kV power line between Koeberg and the Acacia power stations. A new servitude will be required for this line.
3. A scheme whereby the new units at the Ankerlig Power Station will be tripped under predefined network contingency conditions can be implemented as a temporary measure to facilitate the development of 1 or 2 above.

The Eskom preferred option at this stage is to relocate the Acacia units to Ankerlig. However, the final decision will depend on the investigations to either move the Acacia units to the Ankerlig Power Station site or to construct a new 132kV line between Acacia and Koeberg. The final decision will depend on the

[12] The conversion of the power station and the construction of the additional 400 kV transmission power line are the subject of a separate EIA process (EIA Reference numbers: 12/12/20/1014 (power station conversion) and 12/12/20/1037 (transmission power line))

[13] Note that the overload condition on the existing Acacia – Koeberg 400 kV line occur as a second contingency (simultaneous outage on two lines in the Acacia/Muldersvlei/Stikland network).

[14] N-2 grid code refers to the requirement that when two lines are out of service, the full output of the power station can still be evacuated.

[15] The construction and operation of this 400kV power line does not form part of the current process and would be considered as part of a separate EIA process, if required

economic outcome of the studies, as well as future generation, transmission and distribution requirements[16].

Studies undertaken to date indicate that the relocation of the Acacia gas turbines to the Ankerlig Power Station site will relieve the network congestion in and around the Acacia Power Station (located in Goodwood, Cape Town) whilst facilitating the strengthening of the distribution network in the vicinity of the Ankerlig Power Station (located in Atlantis, Cape Town) needed for future growth in the area, especially in the Dassenberg area.

In order to meet the requirements of always having a minimum of two gas turbines available to provide a back-up supply to Koeberg, it is required that the aero derivative gas turbine units be relocated in a phased approach. One unit will need to be relocated from the Port Rex site in East London in order to facilitate the establishment of the Koeberg off-site supply at Ankerlig. Alternative scenarios which are being considered to in terms of the final configuration and operation of these units include:

» Transport and commissioning of two of the Acacia units to the Ankerlig Power Station and one unit to the existing Port Rex Power Station.
» Re-erection and commissioning of three gas turbines at Ankerlig Power Station, and the return of one unit to Port Rex Power Station.
» Re-erection and commissioning of four gas turbines at the Ankerlig Power Station, namely one from Port Rex and three from Acacia.

Although a minimum of three gas turbines is required to facilitate the phasing of the Koeberg off-site supply it is recommended that the fourth unit required to be installed at Ankerlig to facilitate the relocation process should remain at Ankerlig for economic reasons and to provide additional operational flexibility. However, Eskom is re-considering this option, and the Port Rex unit could be relocated back to Port Rex after the units from Acacia have been relocated to the Ankerlig site.

The Ankerlig Power Station site has been determined to be the preferred site for the relocation of the Acacia and Port Rex gas units for off-site back-up supply to Koeberg for the following reasons:

» The Ankerlig Power Station site is a brownfields site already owned and managed by Eskom. The use of this site therefore results in the consolidation of infrastructure of a similar nature on a single site.

[16] Should it be determined that the construction of a new 132kV power line between Acacia and Koeberg is a preferred option, this would be the subject of a separate EIA process.

» The relocation of the units to this site can be linked to Koeberg and integration into the grid, by turning the existing Koeberg-Dassenberg line that runs past the Ankerlig site into Ankerlig.
» The relocation of the units to this site allows for the phased relocation of units, thus ensuring that a minimum of two units will always be available for the emergency off-site supply to Koeberg.
» The Ankerlig Power Station is located relatively close to the Koeberg Power Station. The reliability of supply is therefore enhanced compared to the reliability of a longer Acacia – Koeberg 132kV line. The reliability can potentially be improved by alternative routes for the power to Koeberg that can be made available under emergency conditions if the dedicated Koeberg – Ankerlig 132kV line is not available.
» Relocating the Koeberg off-site supply on the existing Koeberg land has been considered, but is not considered feasible due to land rezoning, cost of transmission integration and fuel logistics considerations.
» The relocation of the Acacia gas turbines to Ankerlig will relieve network constraints that are developing around Acacia due to load growth in the area.

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 2.1). A footprint of approximately 2,5 ha is required to accommodate these units. The aero derivative gas turbine units in question produce approximately 57MW 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).

2.1.1. Additional Fuel Storage Facilities

Relocation of the gas units to the Ankerlig Power Station site would require additional fuel storage facilities at the Ankerlig Power Station to provide a dedicated fuel supply to these units. The relocated units would be fuelled with diesel as the preferred fuel type option due to the diesel fuel infrastructure at Ankerlig, but Kerosene may be used on occasion, if unforeseen circumstances dictate. The storage of an additional 2 million litres of fuel for the aero-derivative gas turbines exclusively for the Koeberg off site supply on the power station site is required. This would result in a total fuel storage capacity of 61,4 million litres on site. An area to the east of the power station expansion has been earmarked for additional fuel storage (refer to Figure 2.1). Provision would be required to be made for 2 x 1 000 m^3 fuel storage tanks, as well as associated off-loading and other related infrastructure.

Figure 2.1: Aerial photograph showing the existing Ankerlig Power Station units, the proposed power station conversion and the area proposed for the Acacia and Port Rex aero derivative gas turbine units

2.1.2. Project Construction Phase

A **phased approach** whereby only one unit can be moved at a time is required to maintain a Koeberg auto-start function associated with the Koeberg off-site supply (which requires that two units be available at all times to provide a dedicated supply). This approach dictates that one gas turbine would be required to be moved from Port Rex to Ankerlig initially before the units from Acacia can be decommissioned and relocated. It is proposed that these units be transported between the sites by road.

Due to the phased approach required for the decommissioning and relocation of the gas turbine units from Acacia and Port Rex, it is expected that the total operation will take 18 – 24 months to complete.

2.1.3. Project Operation Phase

The Acacia and Port Rex units are currently being refurbished as part of an extensive maintenance/refurbishment programme, and the lifespan of these units is expected to be extended by another 20 years, with the option to extend this lifespan at the end of this period through the replacement of components, should this be required.

The creation of additional employment opportunities during the operational phase of the relocated units will be limited. The operations and maintenance of these units are quite specialised and significantly different from the Ankerlig gas turbines (industrial type turbines, vs. aero derivatives). Therefore, it is envisaged that, initially, the current production staff complement (approximately 15 people) would be transferred to Ankerlig to specifically operate and maintain the relocated units from Acacia and Port Rex. This situation could however be reviewed in future, depending on staff requirements.

2.2. Integration of the Acacia and Port Rex gas units at Ankerlig Power Station into the National Grid

Eskom proposes to turn the existing Koeberg-Dassenberg 132 kV line into Ankerlig and supply the dedicated line to connect the aero derivative gas turbines to Koeberg. It should be noted that whilst the main function of the aero derivative gas turbines is for the emergency Koeberg off site supply, its capacity will remain available for network generation support, as is currently the case.

This 132kV power line would be connected to a new 132kV HV yard adjacent to the now-to-be extended substation (high voltage (HV) 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.

During the Scoping Phase, three technically feasible alternative power line alignment corridors (approximately 500 m in width) were identified for investigation within the EIA process (refer to Figure 2.2).

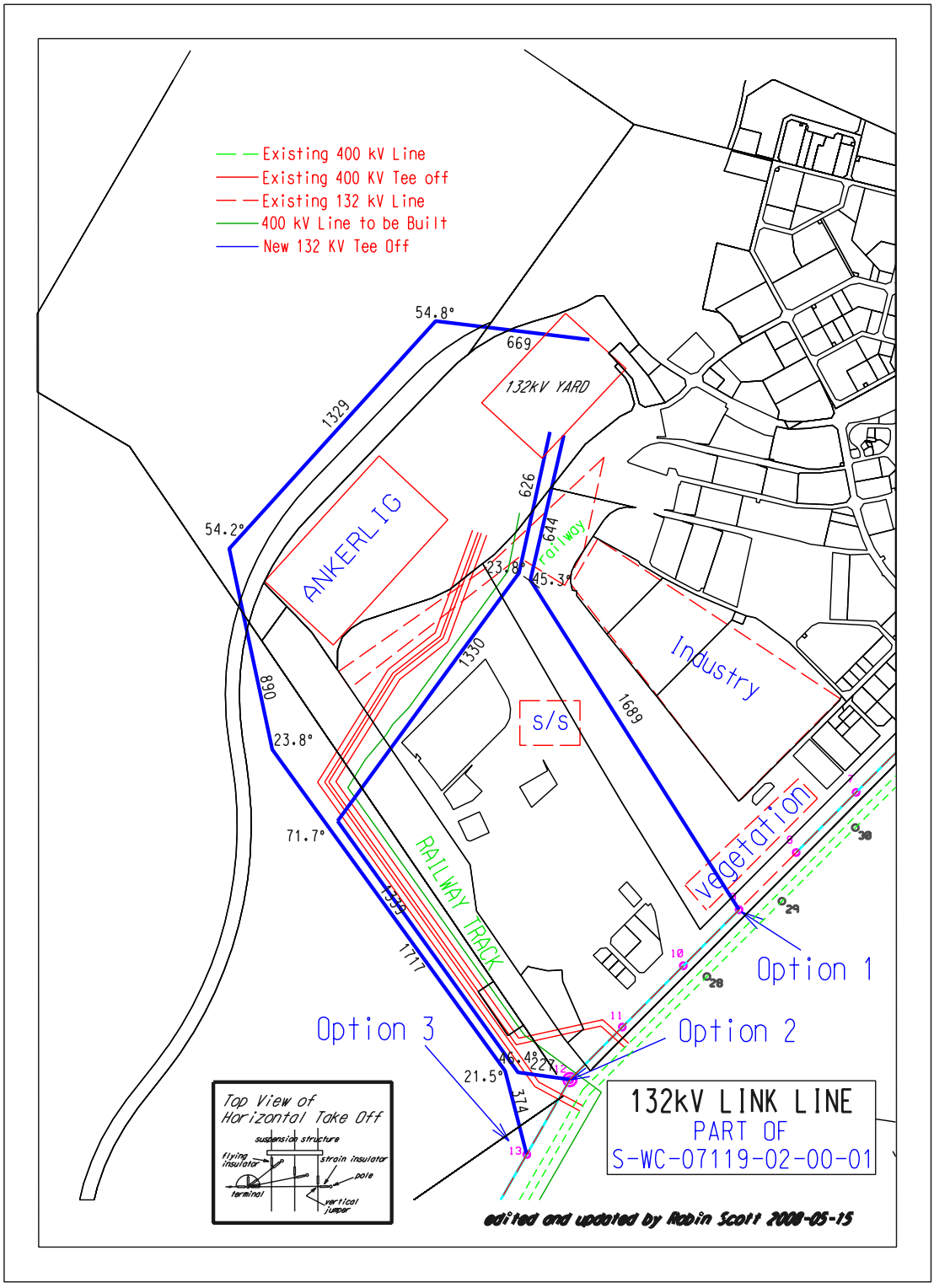

Figure 2.2: Proposed 132kV power line alternatives

Option 1: This option runs from the Koeberg-Dassenberg 132 kV line almost due north-west, entering the 132kV HV yard from the east. This route is approximately 2.6 km in length.

Option 2: This option runs from the Koeberg-Dassenberg 132 kV line south of and parallel to the 400kV lines into the Ankerlig Power Station site from the east. This route would be required to cross under the existing 400kV lines and head north-east, and then follows the same alignment as Option 1 into the 132kV yard from the east. This route is approximately 3.8 km in length.

Option 3: This option runs from the Koeberg-Dassenberg 132 kV line south of and parallel to the 400kV lines into the Ankerlig Power Station site from the west. This proposed route may have to cross the main road from the West Coast Road into Atlantis (i.e. the R307) more than once due to possible space constraints. This route is approximately 5km in length.

From the evaluation of the alternative power line alternatives identified for the proposed power line within the Scoping Report (Savannah Environmental, July 2008), it was concluded that Option 3 is not considered to be preferred from an environmental perspective.

As **Options 1 and 2** cross a disturbed, industrial area, impacts on the environment with the adoption of either of these alternatives are not expected to be significant. Therefore, these alternatives are considered to be acceptable from an environmental perspective and are investigated within this EIA Report.

It is proposed that a double-circuit single pole structure of approximately 25 m be used for the construction of the power line. A servitude width of approximately 35 m would be required to accommodate the power line. Examples of the tower type proposed for use are illustrated in Figure 2.3 below.

Figure 2.3: Examples of the proposed 132 kV monopole double circuit power line tower type.

2.2.1 Project Construction Phase

It is expected that the construction for transmission power line would commence in March 2009 and would take approximately 8 - 10 months to complete.

Construction crews will constitute mainly skilled and semi-skilled workers. No employees will reside on the construction site at any time during the construction phase.

2.2.2. Project Operation Phase

The expected lifespan of the proposed power line is between 35 and 40 years, depending on the maintenance undertaken on the power line structures. The creation of additional employment opportunities during the operational phase of the power line would be limited, and will be restricted to skilled maintenance personnel already employed by Eskom.

APPROACH TO UNDERTAKING THE ENVIRONMENTAL IMPACT ASSESSMENT CHAPTER 3

An Environmental Impact Assessment (EIA) process refers to that process (as per the EIA Regulations) which involves the identification of and assessment of direct, indirect and cumulative environmental impacts associated with the proposed project. The EIA process comprises two phases: **Scoping Phase** and **EIA Phase**. The Scoping process culminates in the submission of a Scoping Report to the competent authority (DEAT in this case) for review and acceptance before proceeding onto the next phase of the process. The EIA culminates in the submission of an EIA Report (including an Environmental Management Plan (EMP)) to the competent authority for decision-making.

The phases of the EIA process are as follows:

The EIA Phase for the proposed project has been undertaken in accordance with the EIA Regulations published in GN 28753 of 21 April 2006, in terms of Section 24(5) of NEMA (Act No 107 of 1998).

The environmental studies for this proposed project were undertaken in two phases, in accordance with the EIA Regulations.

3.1. Phase 1: Scoping Study

The Scoping Study, which commenced in March 2008, provided I&APs with the opportunity to receive information regarding the proposed project, participate in the process and raise issues of concern.

The Scoping Report aimed at detailing the nature and extent of the proposed project, identifying potential issues associated with the proposed project, and defining the extent of studies required within the EIA. This was achieved through an evaluation of the proposed project, involving the project proponent, specialist consultants, and a consultation process with key stakeholders that included both relevant government authorities and I&APs. In accordance with the requirements

of the EIA Regulations, feasible project-specific alternatives (including the "do nothing" option) were identified for consideration within the EIA process.

The draft Scoping Report compiled was made available at public places for I&AP review and comment. Focus Group Meetings were held during this review period in order to facilitate comments on this draft report. All the comments, concerns and suggestions received during the Scoping Phase and the draft report review period were included in the final Scoping Report and Plan of Study for EIA. The Scoping Report was submitted to DEAT, DEA&DP DEDEA in July 2008. The Final Scoping Report was accepted by DEAT, as the competent Authority (refer to correspondence included in Appendix B). In terms of this acceptance, DEAT requested that an EIA be undertaken for the proposed project.

3.2. Phase 2: Environmental Impact Assessment

Through the Scoping Study, a number of issues requiring further study for all components of the project (i.e. the substation and power lines) were highlighted. These issues have been assessed in detail within the EIA phase of the process.

The EIA Phase aimed to achieve the following:

» Provide an overall assessment of the social and biophysical environments affected by the proposed alternatives put forward as part of the project.
» Assess potentially significant impacts (direct, indirect and cumulative, where required) associated with the proposed project.
» Comparatively assess identified alternatives put forward as part of the project.
» Nominate a preferred power line alternative corridor for authorisation by DEAT.
» Identify and recommend appropriate mitigation measures for potentially significant environmental impacts.
» Undertake a fully inclusive public involvement process to ensure that I&AP are afforded the opportunity to participate, and that their issues and concerns are recorded.

The EIA addresses potential environmental impacts and benefits (direct, indirect and cumulative impacts) associated with all phases of the project including design, construction, operation and decommissioning, and aims to provide the environmental authorities with sufficient information to make an informed decision regarding the proposed project.

The EIA process followed for this project is described below.

3.3. Overview of the EIA Phase

The EIA Phase has been undertaken in accordance with the EIA Regulations published in GN 28753 of 21 April 2006, in terms of NEMA. The potential impacts associated with the decommissioning and relocation of the Acacia and Port Rex gas units, as well as the transmission of this power to the national electricity network have been assessed. Key tasks undertaken within the EIA phase included:

» Consultation with relevant decision-making and regulating authorities (at National, Provincial and Local level).
» Undertaking a public involvement process throughout the EIA process in accordance with Regulation 56 of GN No R385 of 2006 in order to identify any additional issues and concerns associated with the proposed project.
» Preparation of a Comments and Response Report detailing key issues raised by I&APs as part of the EIA Process (in accordance with Regulation 59 of Government Notice No R385 of 2006).
» Undertaking of independent specialist studies in accordance with Regulation 33 of GN No R385 of 2006.
» Preparation of a Draft EIA Report in accordance with the requirements of the Regulation 32 GN No R385 of 2006.
» Preparation of a Draft Environmental Management Plan (EMP) in accordance with the requirements of the Regulation 34 GN No R385 of 2006.

These tasks are discussed in detail below. As part of a quality system, control sheets detailing the requirements for the key tasks as listed above have been completed by the EIA team, and are included in Appendix C.

3.3.1. Authority Consultation

The National DEAT is the competent authority for this application. Consultation with the regulating authorities (i.e. DEAT, DEA&DP and DEDEA) has continued throughout the EIA process. On-going consultation included the following:

» Submission of a Final Scoping Report (July 2008) following a 30-day public review period (and consideration of stakeholder comments received).
» Ad hoc discussions with DEAT, DEA&DP and DEDEA in order to clarify the findings of the Scoping Report and the issues identified for consideration in the EIA process.
» Receipt of Acceptance of Scoping Report from DEAT.

The following will also be undertaken as part of this EIA process:

» Submission of a Final Environmental Impact Assessment (EIA) Report following the 30-day public review period (planned for April 2008).
» A consultation meeting with DEAT, DEA&DP and DEDEA in order to discuss the findings and conclusions of the EIA Report.

Consultation with Organs of State that may have jurisdiction over the project has been undertaken as part of the project process. This consultation has included:

» Department of Agriculture
» City of Cape Town
» Buffalo City Municipality

A record of all authority consultation undertaken prior to the commencement of the EIA Phase is included within the Scoping Report.

3.3.2. Comparative Assessment of Alternatives

The following project alternatives were investigated in the EIA:

» The proposed relocation of the Acacia and Port Rex gas units to the site of the existing Ankerlig Power Station.
» Transmission power line Options 1 and 2 (refer to Figure 2.1).

The assessment of these alternatives included the consideration of direct, indirect and cumulative impacts and the possibility of implementing mitigation measures for potentially significant impacts. These alternatives have been assessed within Chapter 5 and within the specialist studies contained within Appendices D - K.

The do-nothing alternative for the proposed project was evaluated within the Scoping Report (Savannah Environmental, July 2008). This alternative was rejected as a feasible alternative and therefore did not require further investigation in the EIA Phase. This conclusion has been accepted by DEAT through their acceptance of the Scoping Report (refer to Appendix B).

3.3.3. Public Involvement and Consultation

The aim of the public participation process was primarily to ensure that:

» Information containing all relevant facts in respect of the proposed project was made available to potential stakeholders and I&APs.
» Participation by potential I&APs was facilitated in such a manner that all potential stakeholders and I&APs were provided with a reasonable opportunity to comment on the proposed project.

» Comment received from stakeholders and I&APs was recorded and incorporated into the EIA process.

Through on-going consultation with key stakeholders and I&APs, issues raised through the Scoping Phase for inclusion within the EIA study were confirmed. All relevant stakeholder and I&AP information has been recorded within a database of affected parties (refer to Appendix L for a listing of recorded parties). While I&APs were encouraged to register their interest in the project from the onset of the process, the identification and registration of I&APs has been ongoing for the duration of the EIA process and the project database has been updated on an on-going basis.

In order to accommodate the varying needs of stakeholders and I&APs, as well as ensure the relevant interactions between stakeholders and the EIA specialist team, the following opportunities were provided for I&APs issues to be recorded and verified through the EIA phase, including:

» Focus group meetings (pre-arranged and stakeholders invited to attend).
» One-on-one consultation meetings and telephonic consultation sessions (consultation with various parties by the project participation consultant as well as specialist consultants).
» Written, faxed or e-mail correspondence.

3.3.4. Identification and Recording of Issues and Concerns

Issues and comments raised by I&APs over the duration of the EIA process have been synthesised into Comments and Response Reports (refer to Appendix M for the Comments and Response Report compiled from both the Scoping and EIA Phases).

The Comments and Response Report include responses from members of the EIA project team and/or the project proponent. Where issues are raised that the EIA team considers beyond the scope and purpose of this EIA process, clear reasoning for this view is provided.

3.3.5. Assessment of Issues Identified through the Scoping Process

Based on the findings of the Scoping Study, issues which require further investigation within the EIA phase were identified. The specialist studies undertaken as part of the EIA, as well as the specialists involved in the assessment of impacts are indicated in Table 3.1.

Table 3.1: Specialist studies undertaken within the EIA phase

Specialist	Area of Expertise	Refer Appendix
Demos Dracoulides of DDA	Air quality impact assessment for the power station	Appendix D
Demos Dracoulides of DDA	Noise impact assessment for the power station	Appendix E
Lourens du Plessis of MetroGIS	Visual impact assessment and GIS mapping for the power station and transmission power line	Appendix F
Liezl Coetzee of Southern Hemisphere	Social impact assessment for the power station and transmission power line	Appendix G
Nick Helme of Nick Helme Botanical Surveys	Vegetation scoping study for the power station and power line	Appendix H
Prof. Le Fras Mouton of the Department of Botany & Zoology, Stellenbosch University	Terrestrial fauna study for the power line	Appendix I
Andrew Jenkins of Endangered Wildlife Trust	Avifauna study for the power line	Appendix J
Tim Hart of the Archaeology Contracts Office, Department of Archaeology: University of Cape Town	Heritage study for the power line	Appendix K

A peer review of the EIA Phase was undertaken by Jeremy Blood of CCA Environmental.

Specialist studies considered direct and indirect environmental impacts associated with the development of all components of the project. Issues were 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 **extent**, wherein it is indicated whether the impact will be local (limited to the immediate area or site of development), regional, national or international. A score of between 1 and 5 is assigned as appropriate (with a score of 1 being low and a score of 5 being high).
» The **duration**, wherein it is indicated whether:
  * the lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
  * the lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
  * medium-term (5–15 years) – assigned a score of 3;

  - long term (> 15 years) - assigned a score of 4; or
  - permanent - assigned a score of 5.
- The **magnitude**, quantified on a scale from 0-10, where a score is assigned:
  - 0 is small and will have no effect on the environment;
  - 2 is minor and will not result in an impact on processes;
  - 4 is low and will cause a slight impact on processes;
  - 6 is moderate and will result in processes continuing but in a modified way;
  - 8 is high (processes are altered to the extent that they temporarily cease); and
  - 10 is 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, and a score assigned:
  - Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
  - Assigned a score of 2 is improbable (some possibility, but low likelihood);
  - Assigned a score of 3 is probable (distinct possibility);
  - Assigned a score of 4 is highly probable (most likely); and
  - Assigned a score of 5 is 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.
- 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).

As Eskom has the responsibility to avoid or minimise impacts and plan for their management (in terms of the EIA Regulations), the mitigation of significant impacts is discussed. Assessment of impacts with mitigation is made in order to demonstrate the effectiveness of the proposed mitigation measures. A draft EMP is included as Appendix N.

3.3.6. Assumptions and Limitations

The following assumptions and limitations are applicable to the studies undertaken within this EIA Phase:

» All information provided by Eskom and I&APs to the Environmental Team was correct and valid at the time it was provided.
» The transmission line corridors identified by Eskom are technically and economically viable. The final power line route will be determined after the EIA process within the nominated preferred power line corridor.
» Strategic, forward planning deliberations are reflected in the IEP, NIRP and ISEP planning processes and do not form part of this EIA.
» This report and its investigations are project-specific, and consequently the environmental team did not evaluate any other power generation or transmission alternatives.

3.3.7. Public Review of Draft EIA Report and Feedback Meeting

Hard copies of the Draft EIA Report were made available for public review from **10 October – 9 November 2008** at the following locations:

» Wesfleur Library
» Avondale Library
» Melkbosstrand Library
» Edgemead Library
» East London central Library
» www.eskom.co.za/eia
» www.savannahSA.com

In order to facilitate comments on the Draft EIA Report, a stakeholder meeting was held during the review period for the Draft EIA Report on 21 October 2008 at Koeberg Visitors Centre from 11:00.

The public review process was advertised in regional and local newspapers: Die Burger, Cape Times, Table Talk, and the Swartland and Weskus Herald, and the Daily Despatch. In addition, all registered I&APs were notified of the availability of the report and public meeting by letter. Identified key stakeholders were personally invited to attend the key stakeholder meeting by letter.

A first round of adverts was placed where a review period of 22 September to 22 October 2008 was advertised. However, due to unforeseen circumstances, the report was not available to be released to the public at this time. The report availability was therefore again advertised with the revised review period. All registered I&APs were notified of this change in the review period for the draft report by letter. Copies of all adverts and notices are included within Appendix Q.

3.3.8. Final EIA Report

The final stage in the EIA Phase entailed the capturing of responses from I&APs on the Draft EIA Report in order to refine this report. It is this final report upon which the decision-making environmental Authorities make a decision regarding the proposed project.

3.4. Regulatory and Legal Context

The South African energy industry is evolving rapidly, with regular changes to legislation and industry role-players. The regulatory hierarchy for an energy generation project of this nature consists of three tiers of authority who exercise control through both statutory and non-statutory instruments – that is National, Provincial and Local levels.

3.4.1. Regulatory Hierarchy

At National Level, the main regulatory agencies are:

» *Department of Minerals and Energy (DME):* This department is responsible for policy relating to all energy forms, including renewable energy. It is the controlling authority in terms of the Electricity Act (Act No 41 of 1987).
» *National Energy Regulator (NER):* This body is responsible for regulating all aspects of the electricity sector, and will ultimately issue generating licenses for power station developments to generate electricity.
» *National Nuclear Regulator (NNR)*: This body is the national institution established by the National Nuclear Regulator Act (Act No 47 of 1999) for the protection of the public, property and environment against nuclear damage. Staff of the NNR carries out technical assessment, authorization and compliance assurance functions and provide the necessary infrastructural support for the effective regulation of safety, including nuclear, waste,

radiation and transport safety. The NNR carries out compliance assurance for various facilities (including Koeberg Nuclear Power Station) in order to provide assurance of holders' compliance with the conditions of nuclear authorisations, through the implementation of compliance inspections.

» *Department of Environmental Affairs and Tourism (DEAT):* This Department is responsible for environmental policy and is the controlling authority in terms of NEMA and the EIA Regulations. DEAT is the competent authority for this project, and charged with granting the relevant environmental authorisation.
» *Department of Transport and Public Works:* This department is responsible for roads and the granting of exemption permits for the conveyance of abnormal loads (as may be associated with the construction phase) on public roads.

At Provincial Level, the main regulatory agency is:

» *Provincial Government of the Western Cape (PGWC) – Department of Environmental Affairs and Development Planning (DEA&DP).* This is the principal authority involved in the EIA process and determines many aspects of Provincial Environmental policy. The department is a commenting authority for this project.
» *Provincial Government of the Eastern Cape – Department of Economic Development and Environmental Affairs (DEDEA).* This is the principal authority involved in the EIA process, and is a commenting authority for this project.

At Local Level the local and municipal authorities are the principal regulatory authorities responsible for planning, land use and the environment. The proposed project falls within the City of Cape Town Metropolitan Municipality and the Buffalo City Municipality. By-laws and policies have been formulated by local authorities to protect environmental resources relating to issues such as air quality, community safety, etc.

3.4.2. Legislation and Guidelines that have informed the preparation of this EIA Report

Those Acts, standards or guidelines which have informed the project process and the scope of issues evaluated in this EIA Study are summarised in Table 3.2.

Table 3.2: List of applicable legislation and compliance requirements required for the decommissioning and relocation of the Acacia and Port Rex gas units, Western Cape Province

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
National Legislation			
National Environmental Management Act (Act No 107 of 1998)	EIA Regulations have been promulgated in terms of Chapter 5. Activities which may not commence without an environmental authorisation are identified within these Regulations. In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed and reported on to the competent authority (the decision-maker) charged by NEMA with granting of the relevant environmental authorisation. In terms of GNR 387 of 21 April 2006, a scoping and EIA process is required to be undertaken for the proposed power station conversion and transmission integration project	National Department of Environmental Affairs and Tourism – lead authority. Western Cape Department of Environmental Affairs and Development Planning – commenting authority.	This EIA report is to be submitted to DEAT, DEA&DP and DEDEA in support of the **application for authorisation** submitted in March 2008.
National Environmental Management Act (Act No 107 of 1998)	In terms of the Duty of Care provision in S28(1) Eskom as the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with this project is avoided, stopped or minimised. In terms of NEMA, it has become the legal duty of a project proponent to consider a project holistically, and to consider the cumulative effect of a variety of impacts.	Department of Environmental Affairs and Tourism (as regulator of NEMA).	While **no permitting or licensing requirements** arise directly by virtue of the proposed project, this section will find application during the EIA and will continue to apply throughout the life cycle of the project.

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
Environment Conservation Act (Act No 73 of 1989)	Section 20(1) provides that where an operation accumulates, treats, stores or disposes of waste on site for a continuous period, it must apply for a permit to be classified as a suitable waste disposal facility.	National Department of Environmental Affairs and Tourism and Department of Water Affairs and Forestry.	As no waste disposal site is to be associated with the proposed project, **no permit** is required in this regard.
Environment Conservation Act (Act No 73 of 1989)	National Noise Control Regulations (GN R154 dated 10 January 1992). Provincial noise control regulations have been promulgated for the Western Cape in Provincial Notice (PN 627/P5309/2299) dated 20 November 1998. In terms of these Regulations, industrial noise limits are 61 dBA and noise limits from any source other than an industrial source are 65 dBA. Draft regulations relating to noise control published in Provincial Gazette No 6412, PN 14 dated the 25th of January 2007. Noise limits are based on the acceptable rating levels of ambient noise contained in SANS 10103.	National Department of Environmental Affairs and Tourism Western Cape Department of Environmental Affairs and Development Planning Local authorities, i.e. City of Cape Town	There is **no requirement for a noise permit** in terms of the legislation. A **Noise Impact Assessment** is required to be undertaken in accordance with SANS 10328. This has been undertaken as part of the EIA process (refer to Appendix E).
National Water Act (Act No 36 of 1998)	Section 21 sets out the water uses for which a water use license is required.	Department of Water Affairs and Forestry	As no water use (as defined in terms of S21 of the NWA) will be associated with the proposed project (as water will be obtained from the existing water allocation to the Ankerlig Power Station), **no water use permits or licenses** are required to be applied for or obtained.
National Water Act (Act No 36 of 1998)	In terms of Section 19, Eskom as the project proponent must ensure that reasonable	Department of Water Affairs and Forestry (as regulator of NWA)	While **no permitting or licensing requirements** arise directly by virtue

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
	measures are taken throughout the life cycle of this project to prevent and remedy the effects of pollution to water resources from occurring, continuing or recurring.		of the proposed project, this section find application during the EIA and will continue to apply throughout the life cycle of the project.
Atmospheric Pollution Prevention Act (Act No 45 of 1965)	Scheduled Processes: A specifications standard applies to the production of noxious or offensive gases. This means that pollution control equipment used in operating the process must conform to certain design criteria. Currently sixty nine (69) scheduled processes are listed in the Second Schedule to the Act. No person may carry on a Scheduled Process in or on any premises unless he is the holder of a current registration certificate. The granting of a permit is subject to compliance with certain minimum standard specifications. To be replaced by the National Environmental Management: Air Quality Act (Act No 39 of 2004) on promulgation of Section 22 of this Act.	National Department of Environmental Affairs and Tourism - Chief Air Pollution Control Officer (CAPCO) Western Cape Department of Environmental Affairs and Development Planning - CAPCO	Eskom have emissions permits for the current operations at the Acacia and Port Rex power stations. Eskom may need to **obtain an amended registration certificate** from the CAPCO at DEAT and/or DEA&DP for the operation of the relocated units.
National Heritage Resources Act (Act No 25 of 1999)	Section 38 states that Heritage Impact Assessments (HIAs) are required for certain kinds of development including » the construction of a road, power line, pipeline, canal or other similar linear development or barrier exceeding 300 m in length; The relevant Heritage Resources Authority must be notified of developments such as linear developments (including roads and power lines), etc. This notification must be provided	South African Heritage Resources Agency (SAHRA) - National Heritage Sites (grade 1 sites) as well as all historic graves and human remains Heritage Western Cape - all Provincial Heritage Sites (grade 2 sites), generally protected heritage and structures (grade 3a – 3c sites) and prehistoric human remains	The area proposed for the location of the Acacia and Port Rex gas units is within the existing Ankerlig power station site. This area has been partially disturbed through construction activities associated with the OCGT power station, and was investigated as part of the EIA undertaken for the Gas 1 development (which considered the entire property now owned by Eskom). No heritage sites are expected to be

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
	in the early stages of initiating that development, and details regarding the location, nature and extent of the proposed development must be provided. Stand alone HIAs are not required where an EIA is carried out as long as the EIA contains an adequate HIA component that fulfils the provisions of Section 38. In such cases only those components not addressed by the EIA should be covered by the heritage component.		located within this area. Therefore, **no permits** will be required to be obtained. An **HIA** was undertaken for the proposed power line (refer to Appendix K). No heritage sites were identified within the proposed power line corridor. However, should sites be identified during the construction phase, a **permit** may be required should these sites be required to be **disturbed or destroyed** as a result of the proposed development.
National Environmental Management: Biodiversity Act (Act No 10 of 2004)	In terms of Section 57, the Minister of Environmental Affairs and Tourism has published a list of critically endangered, endangered, vulnerable and protected species in GNR 151 in Government Gazette 29657 of 23 February 2007 and the regulations associated therewith in GNR 152 in GG29657 of 23 February 2007, which came into effect on 1 June 2007. In terms of GNR 152 of 23 February 2007: Regulations relating to listed threatened and protected species, the relevant specialists must be employed during the EIA phase of the project to incorporate the legal provisions as well as the regulations associated with listed threatened and protected species (GNR 152) into specialist reports in order to identify permitting requirements at an early stage of	National Department of Environmental Affairs and Tourism	As Eskom will not carry on any restricted activity, as is defined in Section 1 of the Act, **no permit** is required to be obtained in this regard. **Specialist flora and fauna studies** are required to be undertaken as part of the EIA process. These studies have been undertaken as part of the previously EIAs undertaken for the Ankerlig power station site and are not required to be repeated within this process. Specialist flora and fauna scoping studies have been undertaken for the proposed power line (refer to Appendix H and I). A **permit** may be required should any **protected plant species** identified within the power line corridor or on the

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
	the EIA phase.		proposed power station site be **disturbed or destroyed** as a result of the proposed development.
Conservation of Agricultural Resources Act (Act No 43 of 1983)	Regulation 15 of GNR1048 provides for the declaration of weeds and invader plants, and these are set out in Table 3 of GNR1048. Weeds are described as Category 1 plants, while invader plants are described as Category 2 and Category 3 plants. These regulations provide that Category 1, 2 and 3 plants must not occur on land and that such plants must be controlled by the methods set out in Regulation 15E.	Department of Agriculture	While **no permitting or licensing requirements** arise from this legislation, this Act will find application during the EIA and will continue to apply throughout the life cycle of the project. In this regard, soil erosion prevention and soil conservation strategies must be developed and implemented. In addition, the existing weed control and management plan within the EMP for the Ankerlig Power Station site must be implemented.
Minerals and Petroleum Resources Development Act (Act No 28 of 2002)	A mining permit or mining right may be required where a mineral in question is to be mined (e.g. materials from a borrow pit) in accordance with the provisions of the Act.	Department of Minerals and Energy	As no borrow pits are expected to be required for the decommissioning and relocation of the Acacia and Port Rex units, **no mining permit or mining right** is required to be obtained.
National Veld and Forest Fire Act (Act No 101 of 1998)	In terms of Section 12 Eskom would be obliged to burn firebreaks to ensure that should a veldfire occur on the property, that same does not spread to adjoining land. In terms of Section 13 Eskom must ensure that the firebreak is wide enough and long enough to have a reasonable chance of preventing a veldfire from spreading; not causing erosion; and is reasonably free of inflammable material. In terms of Section 17, Eskom must have such equipment, protective clothing and trained	Department of Water Affairs and Forestry	While **no permitting or licensing requirements** arise from this legislation, this Act will find application during the operational phase of the project.

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
	personnel for extinguishing fires as are prescribed or in the absence of prescribed requirements, reasonably required in the circumstances.		
Hazardous Substances Act (Act No 15 of 1973)	This Act regulates the control of substances that may cause injury, or ill health, or death by reason of their toxic, corrosive, irritant, strongly sensitising or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products. Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc, nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared to be Group I or Group II hazardous substance; Group IV: any electronic product; Group V: any radioactive material. The use, conveyance or storage of any hazardous substance (such as distillate fuel) is prohibited without an appropriate license being in force.	Department of Health	It is necessary to identify and list all the Group I, II, III and IV hazardous substances that may be on the site by the activity and in what operational context they are used, stored or handled. If applicable, a **license** is required to be obtained from the Department of Health.

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
National Road Traffic Act (Act No 93 of 1996)	The Technical Recommendations for Highways (TRH 11): "Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads" outline the rules and conditions which apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits are described and discussed. Legal axle load limits and the restrictions imposed on abnormally heavy loads are discussed in relation to the damaging effect on road pavements, bridges and culverts. The general conditions, limitations and escort requirements for abnormally dimensioned loads and vehicles are also discussed and reference is made to speed restrictions, power/mass ratio, mass distribution and general operating conditions for abnormal loads and vehicles. Provision is also made for the granting of permits for all other exemptions from the requirements of the National Road Traffic Act and the relevant Regulations.	Western Cape Department of Transport and Public Works (provincial roads) South African National Roads Agency (national roads)	An **abnormal load/vehicle permit** will be required to transport the OCGT units from the Port Rex and Acacia sites to the Ankerlig Power Station site. These include: » Route clearances and permits will be required for vehicles carrying abnormally heavy or abnormally dimensioned loads. » Transport vehicles exceeding the dimensional limitations (length) of 22m. » Depending on the trailer configuration and height when loaded, some of the power station components may not meet specified dimensional limitations (height and width).
National Road Traffic Act (Act No 93 of 1996)	Regulation 274 (read with SABS Code 0232 which deals with transportation of dangerous goods and emergency information systems) states that the regulations are applicable where dangerous goods are transported in quantities, which exceed the exempt quantities (listed in Annex E of SABS Code 0232). Dangerous goods may only be transported in accordance	Department of Transport Western Cape Department of Transport and Public Works (provincial roads) South African National Roads Agency (national roads)	Eskom will need to ensure that **procedures** are in place **to prevent that the quantities of dangerous goods transported exceed the prescribed quantity** (listed in Annex E of SABS Code 0232). Apply for an exemption, if applicable.

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
	with the provisions in the Regulations, unless the Minister of Transport has granted an exemption.		
Development Facilitation Act (Act No 67 of 1995)	Provides for the overall framework and administrative structures for planning throughout the Republic.	Western Cape Department of Environmental Affairs and Development Planning Local authorities, i.e. City of Cape Town	As the Acacia and Port Rex units are to be relocated to the existing Ankerlig Power Station site, no rezoning or sub-division of land is required. Therefore, no land development application is required to be submitted. Eskom must submit a land development application for the proposed power line in the prescribed manner and form as provided for in the Act.
Occupational Health and Safety Act 1993 (Act No 85 of 1993)	Major Hazard Installation Regulations The regulations essentially consists of six parts, namely 1. The duties for notification of a major hazard installation (existing or proposed), including a. Fixed; and, b. Temporary installations. 2. The minimum requirements for a quantitative risk assessment 3. The requirements of an on-site emergency plan 4. The reporting steps of risk and emergency occurrences 5. The general duties required of suppliers 6. The general duties required of local government	Local authorities, i.e. City of Cape Town	Should the facility be determined to be a Major Hazard Installation (MHI) through the quantitative risk assessment, an **MHI Risk Assessment** will be required to be undertaken. This has been concluded to be the case for the Ankerlig Power Station site should the additional fuel storage be implemented.

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
Provincial Legislation			
Land Use Planning Ordinance 15 of 1985	Details land subdivision and rezoning requirements & procedures	Western Cape Department of Environmental Affairs and Development Planning Local authorities, i.e. City of Cape Town	As the Acacia and Port Rex units are to be relocated to the existing Ankerlig Power Station site, no rezoning or sub-division of land is required. Therefore, no application in terms of LUPO is required to be submitted. Given that the power line is proposed on land that is zoned for agricultural use (depending on the preferred power line corridor nominated through the EIA process), a rezoning application in terms of Section 17 of LUPO to an alternative appropriate zone will be required. Rezoning is required to be undertaken following the issuing of an environmental Authorisation for the proposed project.
Nature Conservation Ordinance (Act 19 of 1974)	Article 63 prohibits the picking (defined in terms of article 2 to include, cut, chop off, take, gather, pluck, uproot, break, damage or destroying of certain flora. Schedule 3 lists endangered flora and Schedule 4 lists protected flora. Articles 26 to 47 regulates the use of wild animals	CapeNature	A **permit** may be required should any **endangered or protected plant species** within the power line corridor or on the power station site be **disturbed or destroyed** as a result of the proposed development.
Local Legislation			
City of Cape Town Air Pollution Control By-Law	Section 7: No person shall install, alter, extend or replace any fuel-burning equipment on any	City of Cape Town	Eskom will need to **obtain written authorisation** from the local council

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
12649- 4 February 2004- Provincial Gazette Extraordinary 5979	premises without the prior written authorisation of the Council, which may only be given after consideration of the relevant plans and specifications.		for the alteration of the fuel-burning equipment at the Ankerlig power station (i.e. addition of the 3 Acacia and 1 Port Rex gas units)
By-law relating to Community Fire Safety 11257 – 28 February 2002 – Provincial Gazette Extraordinary 5832	Section 37(1): Prior to the construction of a new installation or the alteration of an existing installation, whether temporary or permanent, for the storage of a flammable substance, the owner or person in charge of the installation must submit a building plan to the Municipality, in accordance with the National Building Regulations. A copy of the approved plan must be available at the site where the installation is being constructed.	City of Cape Town	Eskom must **submit a building plan** to the Municipality, in accordance with the National Building Regulations prior to installing the additional facilities for fuel storage on the site. A copy of the approved plan must be available at the site where the installation is being constructed.
By-law relating to Community Fire Safety 11257 – 28 February 2002 – Provincial Gazette Extraordinary 5832	Section 37(2): Prior to the commissioning of an aboveground or underground storage tank installation, liquid petroleum gas installation or associated pipework, the owner or person in charge of the installation must ensure that it is pressure-tested in accordance with the provisions of the National Building regulations (T1), SABS 0131: Parts1 and 2, SABS 089:Part 3 and SABS 087: Parts 1,3 and 7 in the presence of the controlling authority.	City of Cape Town	Eskom must ensure that any additional fuel tanks proposed to be installed at the Ankerlig Power Station site are **pressure-tested** in accordance with the relevant provisions as stated in the by-law.
By-law relating to Community Fire Safety 11257 – 28 February 2002 – Provincial Gazette Extraordinary 5832	Section 37(6): The owner or person in charge of the premises, who requires to store a flammable gas in excess of 19 kilogram, or a flammable liquid of a danger group (i),(ii),(iii),or (iv) in excess of 200 litres must obtain a flammable substance certificate from the controlling authority.	City of Cape Town	Eskom must obtain a **flammable substance certificate** for any additional fuel storage at the power station site, as prescribed in Schedule 2 of this By-law.

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
By-law relating to Community Fire Safety 11257 – 28 February 2002 – Provincial Gazette Extraordinary 5832	Section 41: The handling, storage and distribution of flammable substances at bulk depots must be in accordance with the National Building regulations (T1), read in conjunction with SABS 089: Part 1.	City of Cape Town	If applicable, Eskom must ensure that handling, storage and distribution of flammable substances (such as fuel) is in accordance with National building regulations.
By-law relating to Community Fire Safety 11257 – 28 February 2002 – Provincial Gazette Extraordinary 5832	Section 53: The operator of a vehicle designed for the transportation of dangerous goods may not operate such a vehicle in the jurisdiction of the controlling authority, unless he has obtained a dangerous goods certificate issued by a fire brigade service in terms of the National Road Traffic Act	City of Cape Town	Eskom must ensure that the contractor/s responsible for the transportation of fuels and other dangerous goods to the power station site have obtained the **dangerous goods certificates** in respect of all vehicles transporting dangerous goods and keep the certificate available in the relevant vehicle.

This chapter provides a description of the environment that may be affected by the proposed project. This information is provided in order to assist the reader in understanding the possible effects of the proposed project on the environment. Aspects of the biophysical, social and economic environment that could be affected by, or could affect the proposed development have been described. This information has been sourced largely from existing information available for the area, and aims to provide the overall context within which this environmental impact assessment process is being conducted.

4.1. Location of the Study Area and Property Description

The existing Acacia Power Station and Ankerlig Power Station are located within the City of Cape Town Metropolitan Municipality in the Western Cape Province. The existing Port Rex Power Station is located within the Buffalo City Municipality in the Eastern Cape Province.

Port Rex and Acacia are gas turbine stations owned by Eskom and are part of Eskom's Peaking Generation group of power stations. These two power stations have three gas turbine generators, each with an output of approximately 57 MW power. The stations have an installed capacity of 171 MW.

The Acacia Power Station is located on Portion 7 of the Farm Montague Gardens in Goodwood, and is owned by Eskom. This site is located in close proximity to the residential areas of Bothasig, Edgemead and Monta Vista (refer to Figures 4.1 and 4.2).

The Port Rex Power Station is located within the Woodbrook industrial area, Cape Road in East London (refer to Figure 4.3), and is owned by Eskom.

The existing Ankerlig Power Station is located within the western portion of the existing proclaimed Industrial Area of Atlantis (~40 km from the Cape Town city centre) on the Farm No 1183 and a Portion of Farm Witzand 2, Atlantis, Cape Town (refer to Figure 4.4), both of which are owned by Eskom. The existing Ankerlig OCGT Power Station consists of nine OCGT units (i.e. four existing OCGT units, plus an additional five OCGT units, currently under construction) each with a nominal capacity of ~150 MW, resulting in a total nominal capacity of 1 350 MW for the power station. An application has been submitted to DEAT for the conversion of these units to Combined Cycle units, thereby increasing their capacity by ~720MW (to a total capacity of ~2 070 MW) (DEAT Reference number: 12/12/20/1014).

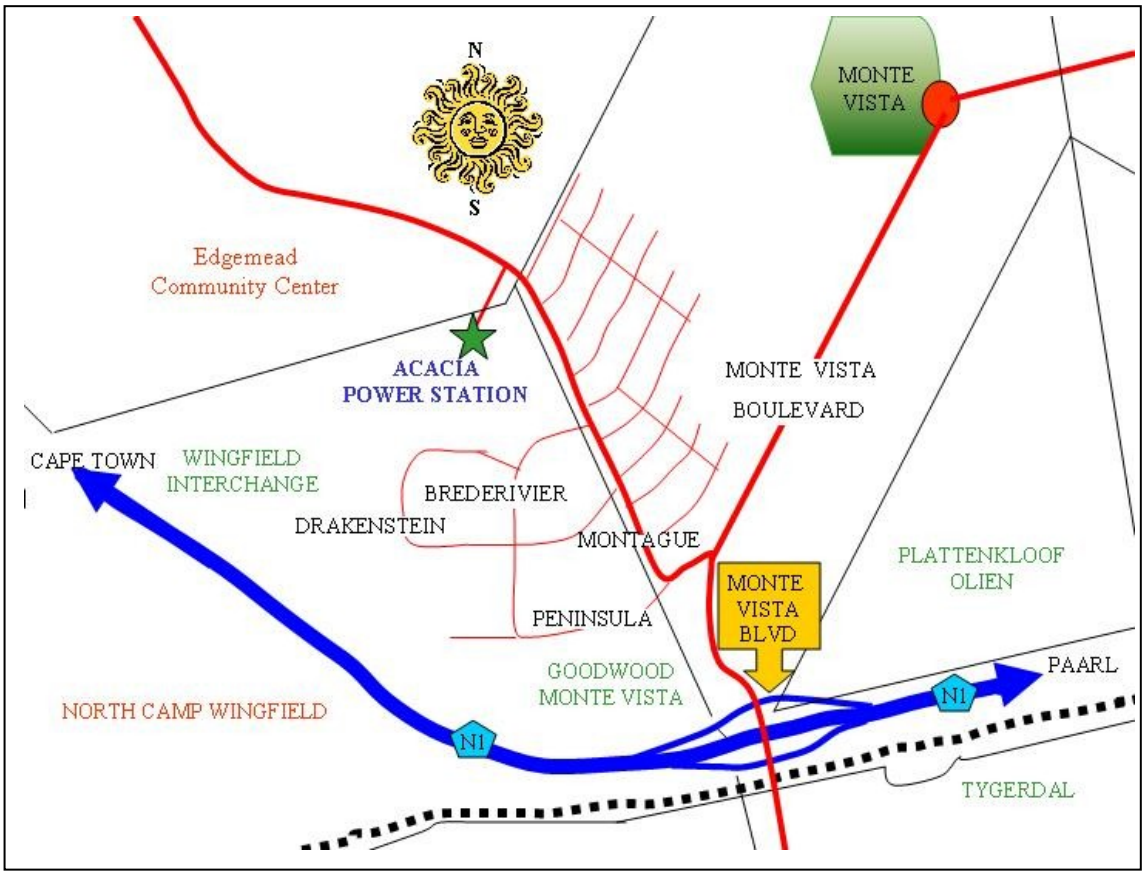

Figure 4.1: Location of Acacia Power Station in Goodwood, Western Cape Province

Figure 4.2: Aerial view of the Acacia Power Station in relation to the surrounding residential areas (indicated by blue arrow)

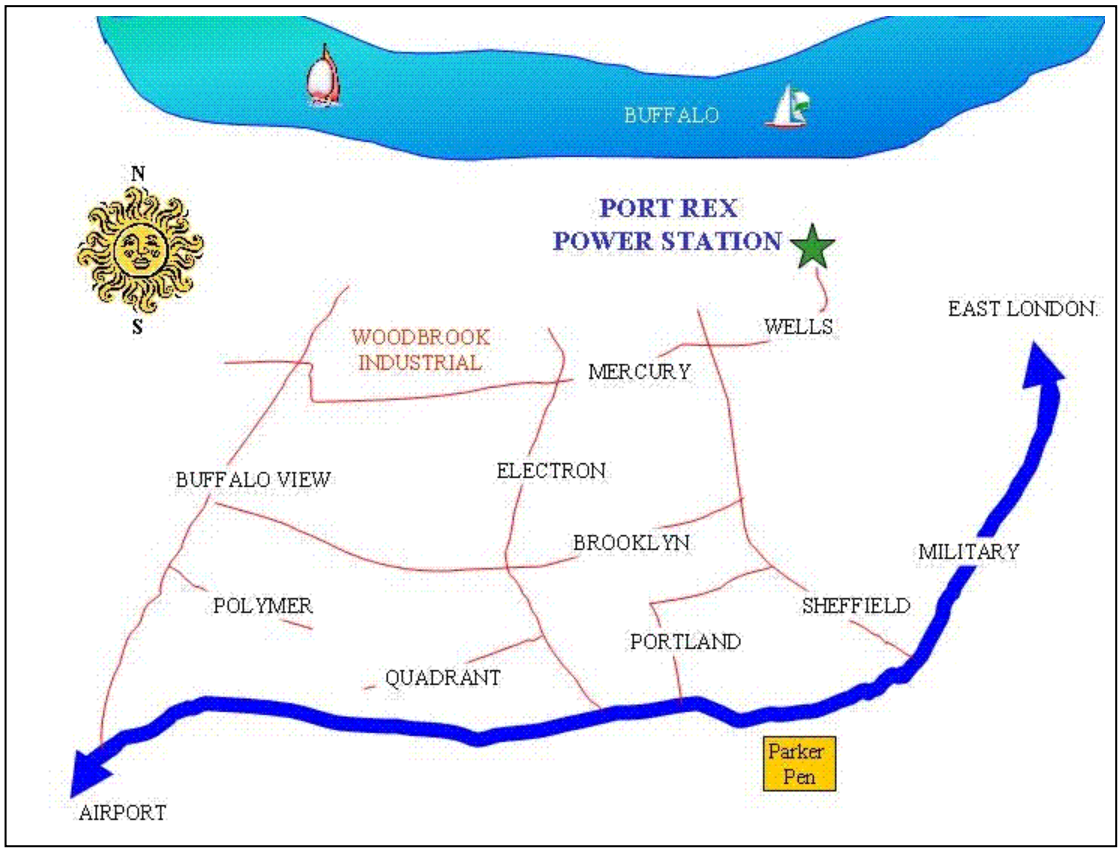

Figure 4.3: Location of Port Rex Power Station in East London, Eastern Cape Province

The Ankerlig Power Station site is far removed from major centres, major tourist attractions and major roads. It is located next to the R307 (Dassenberg Road) that functions as the primary access route to Atlantis and Mamre (north of Atlantis) from Cape Town. The closest major road is the R27 (about 5 km from the site). The R27 functions as the primary connector between Cape Town, Saldanha and the West Coast National Park.

The relocated gas units from the Acacia and Port Rex sites will be developed on the site of the existing Ankerlig Power Station, and will not require any additional land take outside of the existing power station boundaries.

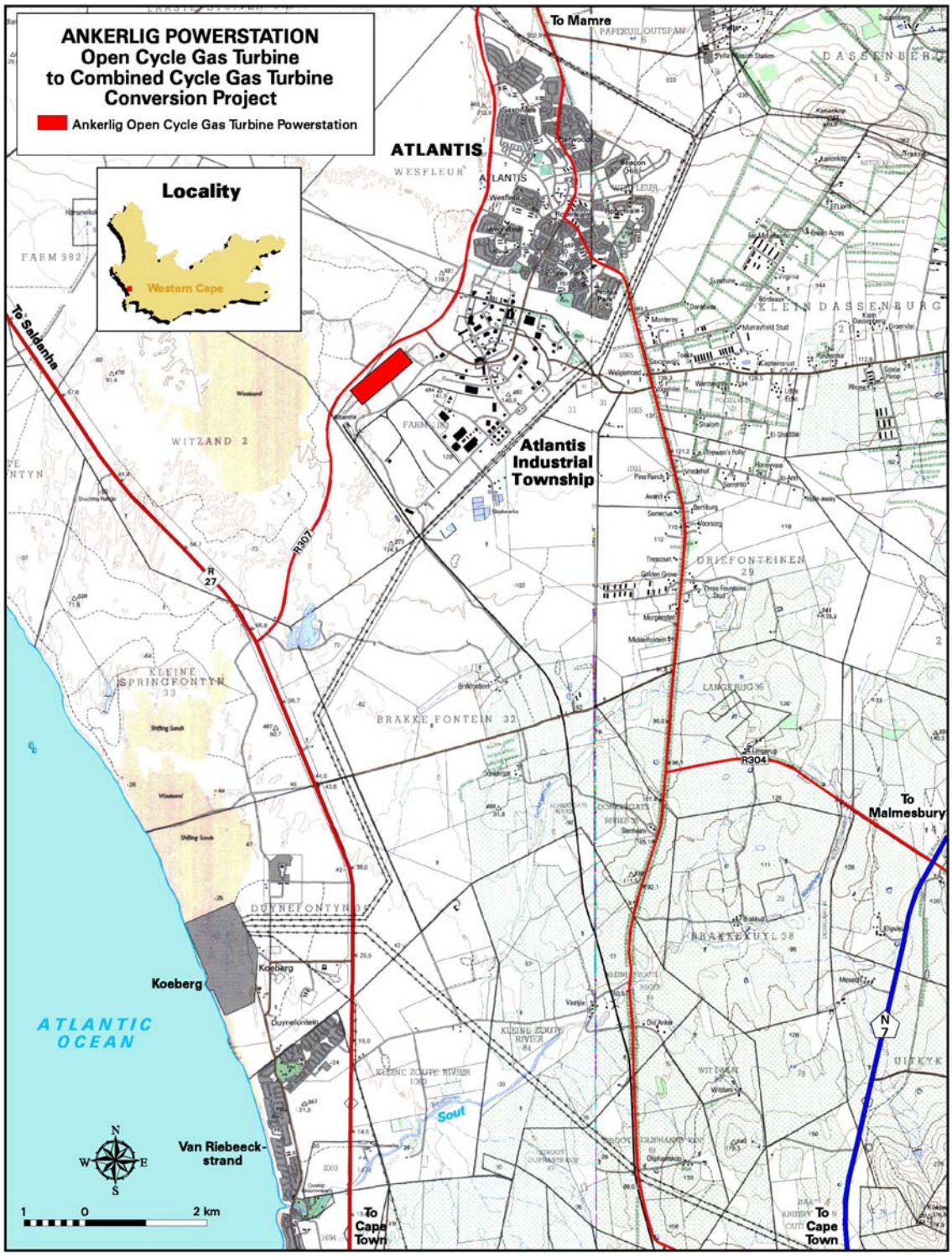

Figure 4.4: Location of Ankerlig Power Station in Atlantis, Western Cape Province

4.2. Social Characteristics of the Area Surrounding the Ankerlig Power Station

Atlantis Industria and its adjoining residential suburb Wesfleur are located ~7 km inland on the Cape West Coast, some 40 km north of Cape Town. Significant landmarks in the wider area are the existing Ankerlig Power Station, Koeberg

Nuclear Power Station located ~9 km to the south-west, and the town of Mamre located ~3 km to the north. Arterial access to the area is provided by the West Coast road (R27) and the N7 national road, and locally by the R307.

The Atlantis Industrial Zone was established as an industrial growth point in the mid-1970s and set up with adequate infrastructure and services to support future growth in the area. The Atlantis industrial area is already served by a tarred industrial road network and essential services (including stormwater, municipal sewer and water supply services and street lighting) which support most of the industrial area. A railway spur is located south of the Ankerlig Power Station site. This railway line is currently not in use.

The residential townships of Atlantis and the informal settlement of Witzand are located between 3-6 km to the north-east and approximately 1 km south of the Ankerlig Power Station site respectively (refer to Figure 4.2). Open farmlands are present to the north, south and east of the site. The area surrounding the power station site is visually dominated by the presence of various types of industrial stacks and buildings located within the surrounding industrial area, and the existing transmission power lines associated with the Ankerlig and Koeberg power stations. The power station site is zoned for industrial use.

The existing noise environment in the Atlantis communities is typical of a suburban residential area next to an industrial zone. The noise environment is affected by localised vehicular traffic, human activities and the industrial activities in the Atlantis Industrial Zone. There is, however, an adequate buffer zone between the industries and the Atlantis communities in order to maintain the noise levels within the recommended guidelines for suburban residential areas.

4.3. Socio-cultural Characteristics of the Area Surrounding the Ankerlig Power Station

4.3.1. Palaeontology

The mineralised bones of ancient fauna are often found in this region of the Cape west coast. Fossils are regularly encountered between Woodstock beach, near Cape Town, and Saldanha Bay to the north of Yzerfontein. These include the material excavated from sites such as Elandsfontein (Singer & Wymer 1968), Duinefontein 2 (Klein et al. 1999) and Langebaanweg (Halkett & Hart 1999; Hendey 1969; Singer 1961). Fossil bones were also seen at Bakoond (Orton 2007) and Tygerfontein (Halkett & Hart 1995), both to the south of Yzerfontein, and a large collection has been made from an occurrence at Melkbosstrand (Hendey 1968). Material from the Milnerton beach area has also been recorded (Avery 1995; Broom 1909). Fossil material at Milnerton includes terrestrial and marine fauna, as well as shell deposits (Avery 1995). Many of these occurrences

occur near the surface with the Melkbosstrand material having been exposed by wind deflation on an old marine terrace some 5 to 6 m above sea level (Hendey 1968). The Duinefontein 2 material occurs buried within red Pleistocene sands immediately north of the Koeberg Power Station within about 0.7 m of the surface (Klein et al. 1999). However, it is not clear how far inland the fossiliferous deposits extend.

4.3.2. Archaeology

Due to the rapid urban expansion of greater Cape Town, little formal archaeological academic research work has been carried out in the general vicinity of the study area; however various impacts assessments have led to the accumulation of some knowledge. Although southern Africa has been occupied by hominids for more than one million years, little evidence of the earliest occupation is preserved within the local region. The fossil site of Duinefontein 2 in the Koeberg Private Nature Reserve contains Early Stone Age (ESA, >200 thousand years ago (kya)) artefacts and similar isolated items are routinely found in ploughed fields across the south-western Cape.

Middle Stone Age (MSA, 200kya – 20kya) artefacts were found in association with the Melkbosstrand fossils (Hendey 1968) indicating at least some MSA presence in the area. MSA artefacts of the Stillbay type have also been collected in the region of Maitland just south of the study area (Goodwin 1926, 1928) and at a site described as being between Milnerton and Maitland (Goodwin & Van Riet Lowe 1929). Artefacts thought to date to the MSA were observed at Groot Oliphantskop to the east of the Melkbosstrand wastewater treatment works (WWTW) (Orton & Hart 2004) and in the region of Vissershok (Kaplan 2002a).

In general, Later Stone Age (LSA, <20kya) sites are far more commonly encountered than earlier material. This may be largely due to burial of older sites beneath recent sand. The only formal excavations to have taken place at an LSA site are those in the near coastal dunes of the Atlantic Beach Golf Estate, just northwest of Blaauwberg Hill and at Melkbosstrand. At the Atlantic Beach sites late Holocene LSA occupation probably pertaining to the Khoekhoen people was found. The sites were located in the high sand dunes and consisted of shell middens and associated artefacts. The lowest shell layers were dated to about AD 700 to AD 750 at AB1 and about AD 1050 at AB3 (Sealy et al. 2005). Kaplan (2000a) and Gray (2000) conducted excavations in a shell midden with material probably dating back to the mid-Holocene but this has never been studied further. Hendey (1968) and Avery (1995) also mention the existence of LSA shell middens among the coastal dunes and photographs of Bloubergstrand from the early 1900s in Duminy (1979) show the kind of dunes that would undoubtedly have housed LSA middens. The Atlantic Beach sites are approximately 1.3 km

from the sea so the chance of finding further sites within the study area does exist.

LSA artefacts have also been noted from the vicinity of Maitland (Goodwin & Van Riet Lowe 1929), the farm Groot Oliphantskop – site of the Omega substation (Kaplan 1996; Orton & Hart 2004) as well as other farms in the area (Kaplan 2004). Halkett (per comm.) reports the presence of ESA scatters on the farm Vaatjie as well as substantial LSA open sites on an adjoining property. ESA material has also be located on the farm Brakkefontein just south of Atlantis (Halkett 2005).

Two burials were reportedly excavated from the Groot Oliphantskop farm in the mid-20th century (Kaplan 1996). Morris (1992) has catalogued human burials from South Africa and records numerous burials from the Milnerton (13 listed), Blaauwberg (20 listed) and Melkbosstrand (22 listed) areas. Others have also been recorded in recent years (e.g. Avery 1995; Deacon & Goosen 1997; Kaplan 2000a, 2002b; Yates 2001) and continue to be found at new development sites.

4.3.3. History

During the early years of the Cape Colony the Dutch settlers made use of the area for grazing but they are unlikely to have left any trace of this use. Early land grants resulted in the construction of farm buildings but not many remain intact today. Those at Groot Oliphantskop are, however, excellent and well preserved examples (Orton & Hart 2004) and, although now modified, the farmstead immediately north of the Blaauwberg Hill also relates to historical occupation of the area. There are excellent examples of vernacular farm structures on the farm Brakkefontein as well as Vaatjie.

The most significant historical event to take place in the area was the Battle of Blaauwberg which occurred in early January 1806. This battle signalled the end of the Dutch occupation of the Cape when the British forces landed at Melkbosstrand, marched over the saddle at the north-eastern edge of Blouberg Hill and defeated the Dutch in a battle among the sand dunes to the east of Kleinberg. This event took place just south of the study area and will not be affected by the proposed activity.

4.4. Biophysical Characteristics of the Area Surrounding the Ankerlig Power Station

The broad terrain morphological unit for the study area is plains and moderately undulating plains. The relatively flat topography of the region is broken only by the sand dunes to the west of the study area towards the Atlantic Ocean.

The Atlantis industrial area borders the Cape West Coast Biosphere Reserve (to the west) that stretches northwards along the coast past the West Coast National Park and Saldanha, and south towards Koeberg. The larger part of the study area consists of vacant land or unspecified land uses, with the town of Atlantis to the north and agricultural holdings and smallholdings east of the study area (refer to Figure 4.5).

The vegetation of the area is Cape Flats Dune Strandveld in the north-western section, Atlantis Sand Fynbos on the sandy sections and Swartland Shale Renosterveld on the clayey sections (Mucina & Rutherford 2006). Alien plant infestation is considerable and large sections have been transformed.

The climate of Atlantis and the Cape West Coast is similar to Mediterranean countries and is influenced by the effects of the nearby Atlantic Ocean, resulting in warm to hot summers and cool winters. The average daily maximum and minimum temperatures in summer are 27°C and 13°C respectively. In winter, the daily temperatures range between an average maximum of 18°C and an average minimum of 6°C.

Rain occurs predominantly in the winter, and the summer months are generally dry. The average annual rainfall is 466 mm. The month with the highest rainfall is July (with a high of 77 mm), and the driest month is February (with a monthly total of 10 mm).

The predominant wind directions in the area are south-westerly to south-easterly during the spring and summer months, and north-westerly to north-north-westerly during the winter months. The strength of the wind is generally greater during the summer months.

The study area is situated on a coastal plain that comprises unconsolidated Cenozoic sediments (mainly quartz sand) associated with the Sandveld Group. These have been deposited on shale bedrock of the Malmesbury Group. The sand deposits average 25 m in thickness, although a maximum of some 80 m is attained in the southwest. Bedrock outcrops of shale occur sporadically along the coast and inland to the north and south of Atlantis. Granite intrusions associated with the Cape Granite Suite are exposed in the vicinity of Mamre. These reach a maximum elevation of some 418 m above sea level in the form of Kanonkop located about 9 km to the northeast.

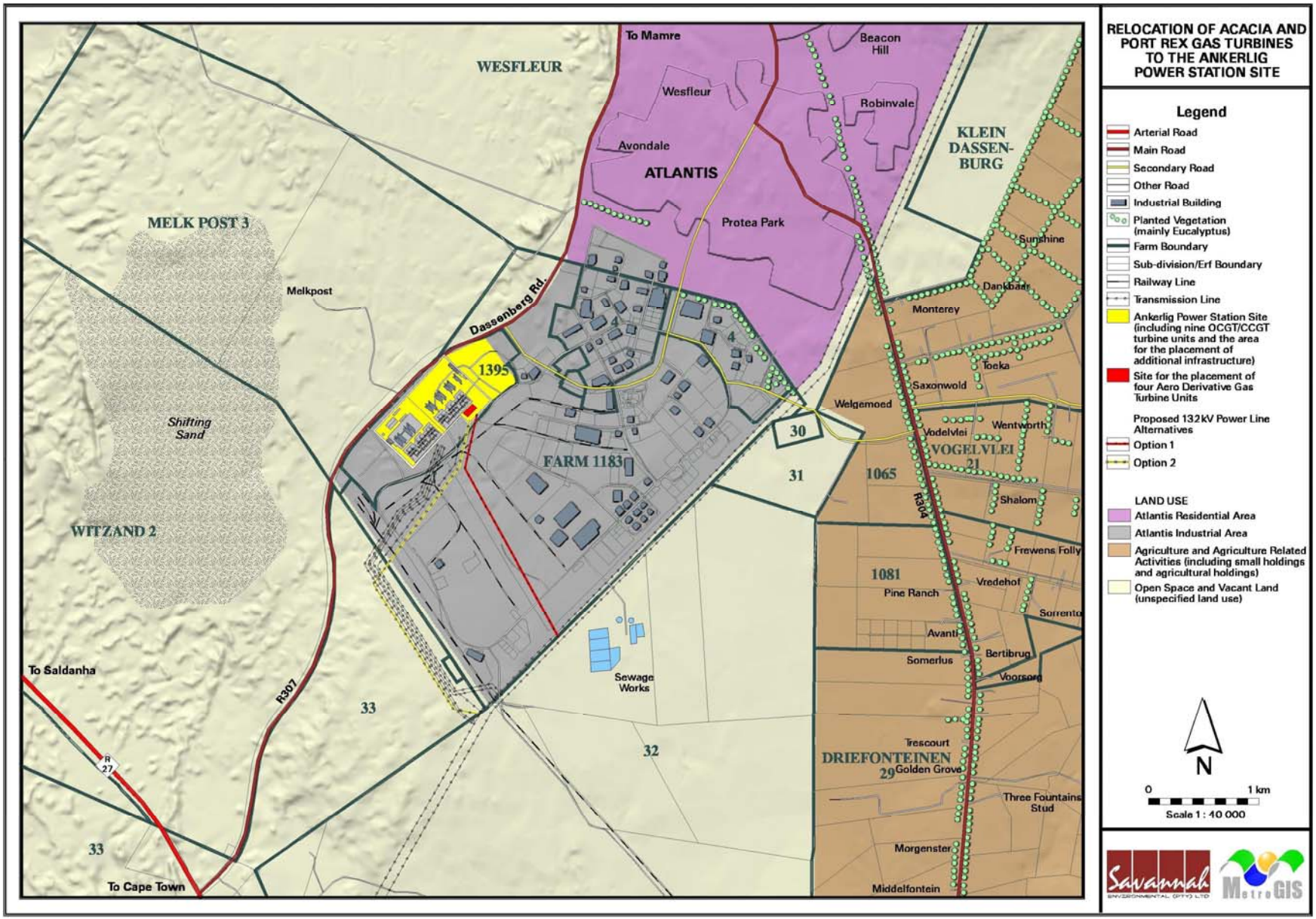

Figure 4.5: Map showing Ankerlig Power Station and surrounding areas

The western portion of Atlantis Industria occupies a surface elevation of around 125 m above sea level. The land surface slopes gently from northeast to southwest. A variety of other sandy soil types are also found across the area. The landscape can be loosely divided into residential, agricultural, industrial and Fynbos shrub land.

The site occurs within quaternary catchment G21B (304 km^2 in extent) of the Berg Water Management Area. The area is largely devoid of rivers and streams. The most significant surface water drainage feature is the south-westerly draining Donkergat River located some 6 km to the southeast of the site (Figure 4.3). The Donkergat River itself is a major tributary of the Sout River, which enters the Atlantic Ocean at Melkbosstrand. A much smaller drainage, the Buffels River, occurs in the Silwerstroom area to the northwest (Figure 4.3). All streams in the study area have an ephemeral character.

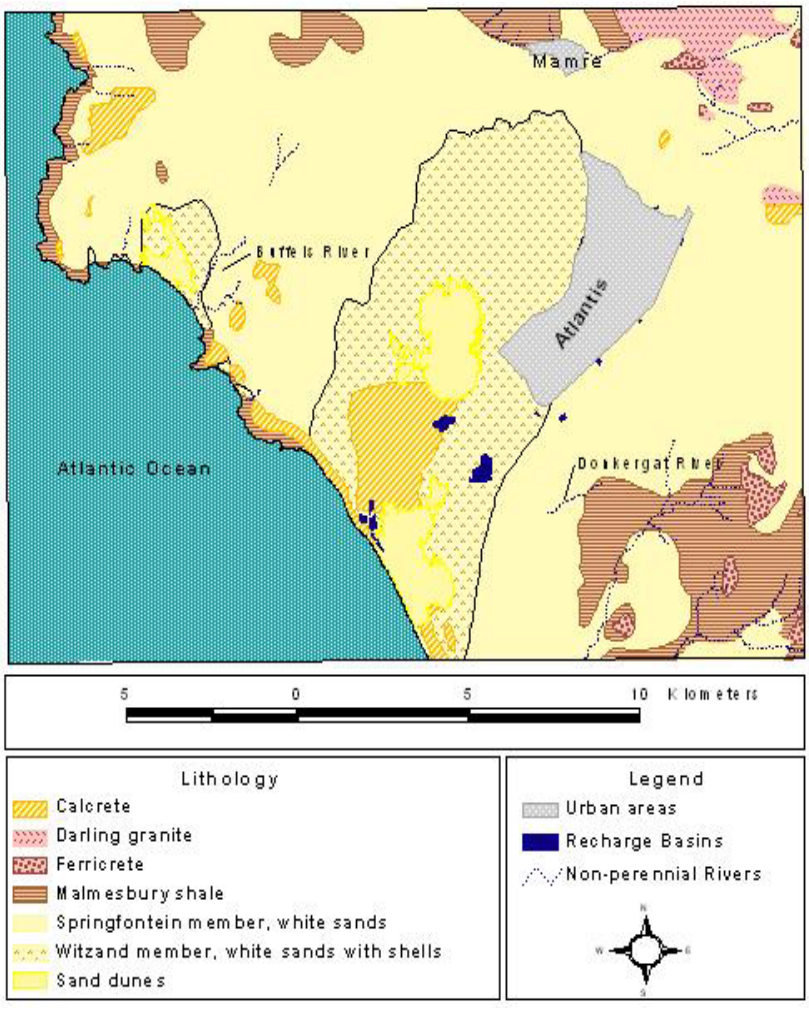

Figure 4.3: Geographical map for Atlantis and its surrounds

A high-yielding spring (approximately 30 L/s) is located at Silwerstroom on the coast, and another at Mamre. Both of these features serve as sources of potable

water. Silwerstroom is utilised by the City of Cape Town, and the spring at Mamre represents the original source of water for the Mission Station established there in 1808.

The study area is part of the Cape Floristic Region, a renowned botanical hotspot with a very high percentage of endemic plant species (species restricted to that area) and threatened plant species. Almost 85% of the threatened plants found in South Africa are restricted to the Cape Floristic Region. The vegetation of the area is Cape Flats Dune Strandveld in the north-western section, Atlantis Sand Fynbos on the sandy sections and Swartland Shale Renosterveld on the clayey sections (Mucina & Rutherford 2006). Alien plant infestation is considerable and large sections have been transformed.

The ecology of the Ankerlig Power Station site has been largely transformed through the construction of the existing Ankerlig Power Station. Small portions of vegetation do, however, still exist in areas not directly impacted by construction. Previous investigations of the vegetation of the power station site (Bohlweki Environmental 2005; 2007) have indicated that the vegetation for a large portion of the site has been substantially modified or disturbed by a variety of factors or combinations thereof. In terms of vegetation integrity, the site was described as fragmented with severely disturbed natural drainage patterns. The vegetation on the site was severely degraded and transformed due to human disturbance, e.g. road building, original site clearance and installation of stormwater drainage systems, change of drainage patterns, illegal quarrying of sand, illegal dumping of waste, frequent fires at the wrong time etc. As a result, large areas were totally dominated by alien invader species such as Port Jackson (*Acacia saligna*) and Rooikrans (*A. cyclops*). The site is separated from the natural vegetation of the Melk Post and Witsand areas to the north and west by the Dassenberg road (R307).

The proposed transmission power line routes traverse the Atlantis industrial area. Both alternatives identified traverse areas which are already transformed as a result of development in the area, and have been re-colonised by alien invaders (such as Port Jackson (*Acacia saligna*) and Rooikrans (*A. cyclops*)), and fynbos pioneer species.

Given the general nature of the area that is semi-industrialised with an adjacent residential area, the likelihood of occurrence of medium to large sized mammals, as well as sensitive faunal species is considered to be limited. The presence of small mammals, in particular terrestrial rodents and subterranean rodents are more likely to occur in the study area.

The study area features five avian microhabitats, i.e. (i) Degraded/recovering Strandveld or Sand Fynbos, (ii) Alien Acacia-infested Strandveld or Sand Fynbos,

(iii) developed areas, from rural homesteads and farm buildings to light-moderate industrial development. The area is likely to support 66 bird species, of which two species are Red-listed and 17 species are regional endemics or near-endemics (Barnes 2000, Hockey et al. 2005). None of the bird populations present in the impact area are likely to be of high conservation value. The natural vegetation remnants present within the impact zone are likely to support the highest avian diversity.

The Cape West Coast Biosphere Reserve is situated in the coastal zone north of Cape Town. Core areas consist of the West Coast National Park, and Dassen and Vondeling Islands. There is also a buffer zone and transition zones. The Atlantis study area is located within the transition zone of the Cape West Coast Biosphere Reserve[17] (refer to www.capebiosphere.co.za/CONSERVATION.55.0.html).

Other conservation areas in the region surrounding the power station site include the Koeberg Private Nature Reserve, the Blouberg Nature Reserve and the Blaauw Mountain Private Nature Reserve.

[17] Transition zones are areas of co-operation that contain a variety of land uses, including settlements, where the area's natural resources are sustainably developed for the benefit of those who live there.

ASSESSMENT OF ISSUES ASSOCIATED WITH THE PROPOSED RELOCATION OF THE ACACIA AND PORT REX GAS UNITS AND THE POWER LINE INTEGRATION CHAPTER 5

This section of the EIA Report serves to assess the identified potential environmental (socio-economic and biophysical) impacts associated with:

» the proposed decommissioning of the three (3) gas units at the Acacia and one (1) gas unit at the Port Rex[18] power station sites;
» the relocation of these units to the Ankerlig Power Station site in Atlantis; and
» the two alternatives identified for the construction of the associated 132kV HV yard and 132kV power line from Ankerlig Power Station to the Koeberg-Dassenberg 132kV line.

Potential direct, indirect and cumulative impacts associated with the proposed conversion project are assessed, and recommendations are made regarding the management of the impacts for inclusion in the draft EMP (refer to Appendix N).

5.1. Assessment of Potential Impacts on Air Quality

5.1.1. Impacts associated with the decommissioning of the gas units at the Acacia site

The Acacia Power Station is located in close proximity to the residential areas of Bothasig, Edgemead and Monta Vista. The power station currently has an existing impact on the air quality of the local area. The decommissioning of the units at the Acacia Power Station site will remove this existing impact from these areas and is therefore expected to have a positive impact on the air quality at a local level.

5.1.2. Impacts associated with the decommissioning of the gas units at the Port Rex site

The Port Rex Power Station is located within the Woodbrook industrial area near East London. The power station currently has an existing impact on the air quality of the local area. The decommissioning of one unit at the Port Rex Power Station site will reduce this existing impact, and is therefore expected to have a positive impact on the air quality at a local level. However, due to the industrial nature of this area, and the fact that only one unit will be decommissioned, this

[18] 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.

impact is expected to be of low significance. However, 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.

5.1.3. Impacts associated with the relocation of the gas units to the Ankerlig Power Station site

The Ankerlig Power Station is situated on the western side of the Atlantis Industrial Zone. This area is located approximately 7 km inland from the Cape West Coast, approximately 40 km north of Cape Town. The existing Ankerlig Power Station is approximately 10 km northeast of Eskom's Koeberg Nuclear Power Station. The existing air quality in the area is considered to be relatively good. There are several air pollution sources in the Atlantis Industrial area that could potentially have a negative impact on the ambient air quality. Apart from industrial activities in the area and the existing Ankerlig Power Station, other potential air pollution sources include vehicular traffic, domestic fires, ploughed fields and non-vegetated land.

Potentially sensitive receptors surrounding the power station site include (refer to Figure 5.1):

» The residential township of Atlantis
» The informal settlement of Witzand
» Open farmlands in the vicinity of the power station site

Potential impacts are associated with both the construction and operational phases of the proposed relocation project. The main air pollution sources identified to be associated with the proposed power station units include (DDA, 2008):

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

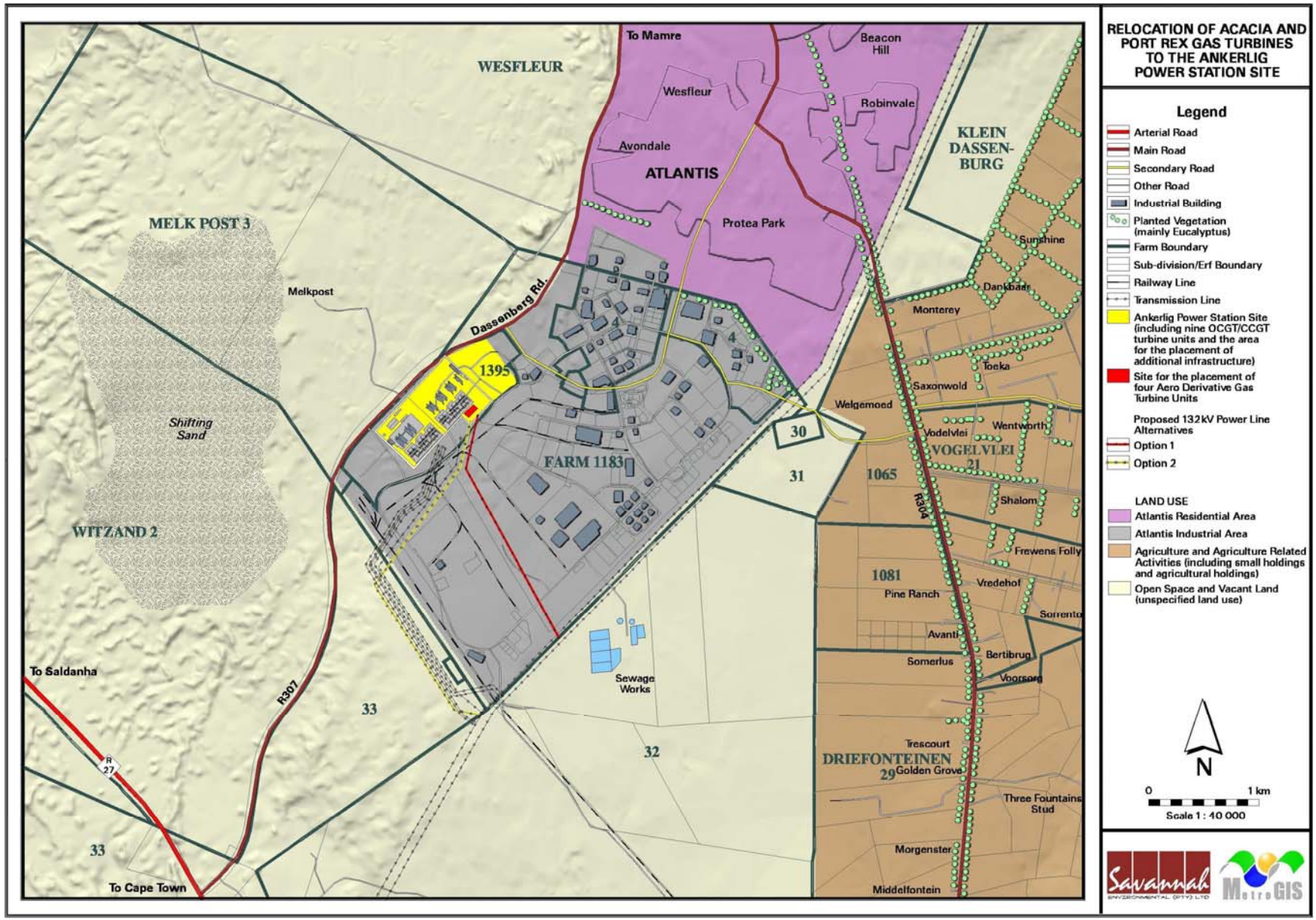

Figure 5.1: Locality map showing the power station site in relation to surrounding areas

Impact tables summarising the significance of air quality impacts associated with the relocation of the gas units (with and without mitigation)

Nature: Increase of air pollution levels and dust deposition around the power station construction area

Dust would be generated through the various construction activities of the proposed relocated units at the Ankerlig Power Station. The greatest impact of the dust would be limited to the immediate vicinity of the proposed site.

	Without mitigation	**With mitigation**
Extent	Local (2)	Local (2)
Duration	Short-term (2)	Short-term (2)
Magnitude	Low (4)	Minor (2)
Probability	Probable (3)	Improbable (2)
Significance	**Low (24)**	**Low (12)**
Status (positive or negative)	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources?	No loss	No loss
Can impacts be mitigated?	Yes	Yes

Mitigation:

» Speed reduction to below 20 km/hr within and around the site.
» Paving of internal roads as soon as possible.
» Application of water suppression.

Cumulative impacts:

» Cumulative impacts due to the existing power station units, industrial sources in the adjacent Atlantis Industrial area and vehicular traffic in the area.

Residual Impacts:

» No residual impact after the activity ceases.

Nature: Increase of the air pollution levels around the power station site

The exhaust emissions during normal operation, start-up and upset conditions could have a negative impact on the air quality of residential townships in close proximity to the power station. The type of emissions are expected to be similar in nature to those associated with the OCGT power station units at the Ankerlig Power Station site, and include NO_2, sulphur dioxide, PM10 and volatile organic compounds (VOCs). The only pollutant of potential concern is NO_2 which reached 85% of the 200 µg/m3 hourly guideline for the maximum 1-hour NO_2 concentration. The daily and annual maximum for this pollutant, however, reached 28% and 2.3% of their guidelines respectively. The other pollutants examined, i.e. sulphur dioxide, PM10 and VOCs were well within their respective guidelines for all sensitive receptor locations.

	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (2)
Duration	Long-term (4)	Long-term (4)
Magnitude	High impact (8)	Moderate (6)
Probability	Highly probable (4)	Probable (3)
Significance	**Moderate (56)**	**Moderate (36)**
Status (positive or negative)	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources?	No irreplaceable loss	No irreplaceable loss
Can impacts be mitigated?	Yes	Yes
Mitigation: » The relocated units to utilise diesel as a fuel source (as is currently the case for the Ankerlig units) instead of Kerosene.		
Cumulative impacts: Cumulative impacts due to emissions from existing Ankerlig Power Station units, industrial air pollution sources in the adjacent Atlantis Industrial area and vehicular traffic in the area.		
Residual Impacts: No residual impact after the activity ceases.		

5.1.4. Conclusions and Recommendations

The decommissioning of the units at the Acacia Power Station site will remove the existing impact on the local air quality from the area and is therefore expected to have a positive impact on the local environment. The decommissioning of one of the units at the Port Rex Power Station site will reduce the existing impact on air quality at a local level 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.

Based on the air quality modelling results, the following can be concluded for the relocation and operation of the Acacia and Port Rex units at the Ankerlig site:

» During the construction phase, the impact is considered to be Low.
» For the operational phase, if the relocated units utilise the same type of cleaner diesel as used by the Ankerlig units, the resulting cumulative impacts will be of Moderate significance. The maximum 1-hour NO_2 concentration reached 85% of the 200 µg/m^3 hourly guideline. The daily and annual maximum for this pollutant, however, reached 28% and 2.3% of their guidelines respectively.
» The other pollutants examined, i.e. sulphur dioxide, PM10 and VOCs were well within their respective guidelines for all sensitive receptor locations.

5.2. Assessment of Potential Noise Impacts

5.2.1. Impacts associated with the decommissioning of the gas units at the Acacia site

The Acacia Power Station is located in close proximity to the residential areas of Bothasig, Edgemead and Monta Vista. The power station currently has an existing noise impact on the ambient noise levels of 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 noise levels at a local level.

Noise associated with decommissioning activities is expected to be of local extent and short duration. The decommissioning operations are not expected to have any significant impact on the nearest communities in Bothasig, Edgemead and Monta Vista. The noise impact is therefore expected to be localised and of low significance in the short-term and, therefore, does not require any further investigation.

5.2.2. Impacts associated with the decommissioning of the gas units at the Port Rex site

The Port Rex Power Station is located within the Woodbrook industrial area near East London. The power station currently has an existing noise impact on the ambient noise levels of the local area. The decommissioning of one unit at the Port Rex Power Station site will reduce this existing impact, and is therefore expected to have a positive impact on the noise levels at a local level. However, due to the industrial nature of this area, and the fact that only one unit will be decommissioned, this impact is expected to be of low significance. However, 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.

Noise associated with decommissioning activities is expected to be of local extent and short duration. The decommissioning operations are not expected to have any significant impact on the surrounding area due to the industrial nature of this area. The noise impact is expected to be of low significance in the short-term and, therefore, is not investigated in any further detail.

5.2.3. Impacts associated with the relocation of the gas units to the Ankerlig Power Station site

The existing noise environment in the residential areas surrounding the Ankerlig Power station is typical of a suburban residential area next to an industrial zone.

The noise environment is affected by localised vehicular traffic from the R27 and R307, human activities and the industrial activities in the Atlantis Industrial area.

The acceptable daytime and night time rating levels in a residential district with little road traffic are, respectively, 50 dBA and 40 dBA. The current existing noise environment around the Ankerlig Power Station has noise levels of around 50 dBA, primarily due to the construction activities currently taking place, the existing industrial sources and the R307. The noise levels in the most southern part of the Atlantis residential area, i.e. Avondale and Protea Park, were around 48 dBA during day and night-time. The industrial activity from the Atlantis Industrial area, as well as construction activities were audible but not intrusive.

Potential noise impacts associated with the relocated gas units from Acacia and Port Rex would be associated with the construction and operation activities. These noise impacts are expected to be of low significance in the short-term and, therefore, are not investigated in any further detail.

Impact tables summarising the significance of noise impacts associated with the relocated gas units (with and without mitigation)

Nature of Impact: Increase of noise levels around the power station area during construction		
	Without mitigation	**With mitigation**
Extent	Site (1)	Site (1)
Duration	Very short-term (1)	Very short-term (1)
Magnitude	Minor (2)	Minor (2)
Probability	Probable (3)	Improbable (2)
Significance	**Low (12)**	**Low (8)**
Status (positive or negative)	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources?	No loss	No loss
Can impacts be mitigated?	Yes	Yes
Mitigation: » During construction the following is recommended: ∗ Diesel-powered and other equipment should be maintained regularly and have appropriately fitted silencers. ∗ Personnel should be specifically trained, in order to adhere to operational procedures that reduce the occurrence and magnitude of individual noisy events. ∗ Perimeter noise measurements should be performed biannually. The monitoring to include one or two points within the Atlantis community. » For the operational phase, the following is recommended: ∗ The mitigation measures, in terms of the existing enclosures at the Acacia Power Station, should be reinstalled at the new site.		

* Perimeter noise monitoring should be performed annually. For comparison purposes, the measurement points should include the measurement locations utilised in the noise impact assessment.
Cumulative impacts:
» Cumulative impacts due to existing and proposed Ankerlig Power station units, industrial noise sources in the adjacent Atlantis Industrial area and vehicular traffic in the area.
Residual Impacts:
» No residual impact after the activity ceases.

Nature of Impact: Increase of noise levels around the power station area during operation of the Acacia and Port Rex gas units		
	Without mitigation	**With mitigation**
Extent	Local (2)	Local (2)
Duration	Long-term (4)	Long-term (4)
Magnitude	Low (4)	Low (4)
Probability	Improbable (2)	Improbable (2)
Significance	**Low (20)**	**Low (20)**
Status (positive or negative)	Negative	Negative
Reversibility	Reversible	Reversible
Irreplaceable loss of resources?	No loss	No loss
Can impacts be mitigated?	Yes	Yes
Mitigation:		
» No additional mitigation is necessary other than the existing enclosures.		
Cumulative impacts:		
» Cumulative impacts due to existing and proposed Ankerlig power station units, industrial noise sources in the adjacent Atlantis Industrial area and vehicular traffic in the area.		
Residual Impacts:		
» No residual impact after the activity ceases.		

5.2.4. Conclusions and Recommendations

The decommissioning of the units at the Acacia Power Station site will remove the existing impact on the local air quality from the area and is therefore expected to have a positive impact on the local environment. The decommissioning of one of the units at the Port Rex Power Station site will reduce the existing impact on air quality at a local level 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.

Based on the noise modelling results, the following can be concluded for the relocation and operation of the Acacia and Port Rex units at the Ankerlig site:

» The relocation of the Acacia and Port Rex Power Station units will have only a local impact around the north-western boundary when compared to the open cycle levels, increasing the noise levels by 3 dBA.
» The Acacia and Port Rex units will not have any significant cumulative effect on the noise-sensitive receptors of Atlantis, since the increase above the closed cycle noise levels in the Avondale and Protea Park areas will be below 0.3 dBA.
» The cumulative impact of the proposed combined cycle units[26] can potentially have a significant effect on the existing noise levels around the power station site. The introduction of substantial mitigation measures, however, can reduce these levels to the ones generated by only the open cycle units.
» The overall noise impact due to the relocation of the Acacia and Port Rex units, assuming the same enclosures will be utilised and taking into consideration the resulting noise levels in the noise-sensitive area of Atlantis, was found to be Low.

During construction the following is recommended:

» Diesel-powered and other equipment should be maintained regularly and have appropriately fitted silencers.
» Personnel should be specifically trained, in order to adhere to operational procedures that reduce the occurrence and magnitude of individual noisy events.
» Perimeter noise measurements should be performed biannually. The monitoring to include one or two points within the Atlantis community.

For the operational phase of the Acacia and Port Rex units, the following is recommended:

» The mitigation measures, in terms of the existing enclosures at the Acacia Power Station, should be reinstalled at the new site.
» Perimeter noise monitoring should be performed annually during both day- and night-time conditions. For comparison purposes, the measurement points should include the measurement locations utilised in the noise impact assessment.

[26] Impacts associated with this proposed project are assessed within a separate EIA Report (DEAT Reference number: 12/12/20/1014)

5.3. Assessment of Potential Visual Impacts

5.3.1. Impacts associated with the decommissioning of the gas units at the Acacia site

The Acacia Power Station is located in close proximity to the residential areas of Bothasig, Edgemead and Monta Vista. The power station currently has an existing visual impact on the local area. The decommissioning of the units at the Acacia Power Station site will reduce this existing impact from the area and is therefore expected to have a positive impact on the visual quality at a local level. The existing transmission HV yard will not be decommissioned, and therefore this positive impact is expected to be limited.

5.3.2. Impacts associated with the decommissioning of the gas units at the Port Rex site

The Port Rex Power Station is located within the Woodbrook industrial area near East London. The power station currently has an existing visual impact on the local area. The decommissioning of one unit at the Port Rex Power Station site will reduce this existing impact and is therefore expected to have a positive impact on the visual quality at a local level. However, due to the industrial nature of this area, and the fact that only one unit will be decommissioned, this impact is expected to be of low significance. It is important to note that 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.

5.3.3. Impacts associated with the relocation of the gas units to the Ankerlig Power Station site

The Ankerlig Power Station site is removed from major centres, tourist attractions and major roads. It is located next to the R307 (Dassenberg Road) that functions as the primary access route to Atlantis and Mamre (north of Atlantis) from Cape Town. The closest major road is the R27 (about 5 km from the site). The R27 functions as the primary connector between Cape Town, Saldanha and the West Coast National Park. Significant landmarks in the wider area are the existing Ankerlig Power Station, Koeberg nuclear power station located some 9 km to the south-west, and the town of Mamre located some 3 km to the north.

The visual impact assessment is based on the visual exposure (visibility), the visual distance (proximity of the observer) and the viewer incidence (number of observers) of the proposed project infrastructure. It takes into account the size (width, height and length) of the relocated gas turbines. The combined results of the visual exposure, viewer incidence/perception and visual distance of the proposed infrastructure are displayed on Figure 5.2. Here the weighted impact

and the likely areas of impact are indicated as a visual impact index. Values were assigned for each potential visual impact per data category (as mentioned above) and merged in order to calculate the visual impact index. An area with short distance visual exposure of the project infrastructure, a high viewer incidence and a predominantly negative perception of the structures would therefore have a higher value (greater impact) on the index.

The visual impact index has a maximum potential value of 5 (very high visual impact). The proposed gas turbine units do not reach this value due to the units' visual exposure being contained primarily within the industrial area. The "high visual impact" rating or value, as well as most of the "medium visual impact" rating, is also contained within the Atlantis Industrial Area. A section of the Dassenberg Road (R307), north of the power station site, may experience a medium visual impact at a viewing distance of approximately 600m at the closest. 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.

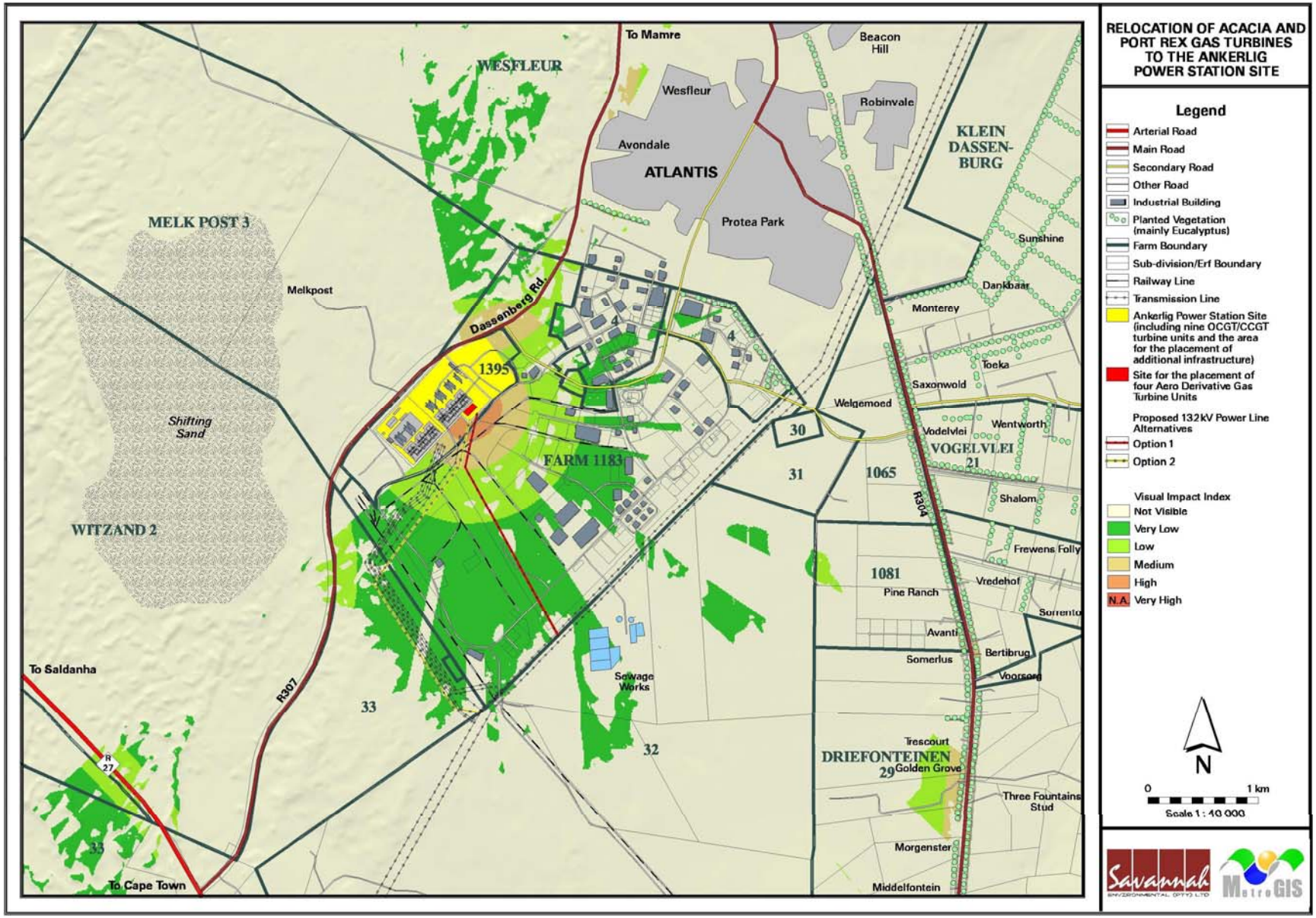

Figure 5.2: Visual impact index of the four Aero Derivative Gas Turbine Units (note: power line not included)

Impact table summarising the significance of visual impacts associated with the relocated gas units (with and without mitigation)

Nature of Impact: Potential visual impact on users of Dassenberg road

The primary area of potential medium visual impact would occur along a section of this road at a distance of approximately 600m at the closest. It must however be borne in mind that the visual impact associated with the proposed gas turbine units will be an additional impact and that the initial visual impact has already occurred during the construction of the original OCGT power plant and its associated infrastructure. This initial visual impact was further compounded by the capacity increase (i.e. the construction of additional OCGT units) as addressed by a previous visual impact assessment report (MetroGIS (Pty) Ltd, 2007). It will in all likelihood also be further mitigated, to some extent, if the proposed OCGT to CCGT conversion project is approved (refer MetroGIS (Pty) Ltd, 2008).

The envisaged visual impact of the four Aero Derivative Gas Turbine Units are not as significant as would be the case if this had been a "green fields" development site.

	Without mitigation	**With mitigation**
Extent	Local (4)	NA
Duration	Long term (4)	NA
Magnitude	Moderate (5)	NA
Probability	Probable (3)	NA
Significance	**Moderate (39)**	NA
Status (positive or negative)	Negative	NA
Reversibility	None	NA
Irreplaceable loss of resources?	No	NA
Can impacts be mitigated?	No	NA

Mitigation:

General mitigation includes maintenance and general appearance of the facility. Timely maintenance of the gas turbine units and the general surrounds of the property (gardens, access roads, etc.) can prevent the visual impact of degradation and perceived poor management. The most notable aspect of maintenance on this type of structure is the painting of the turbine units. In this regard and as a further mitigation to the visual impact, overtly contrasting and bright colours should be avoided. Natural hues that compliment the natural environment can soften the general appearance of the gas turbine units. The colour schemes currently utilised for the OCGT units is deemed appropriate and should be continued for the relocated gas turbine units.

Cumulative impacts:

Each new development, expansion or increase in dimensions of the power station infrastructure has the potential to attribute to the accumulation of the visual impact of the facility along the Dassenberg Road.

Residual impacts:

None

5.3.4. Impacts associated with the 132kV power line between the Ankerlig Power Station and the Koeberg-Dassenberg line and HV Yard

Viewshed analyses were not undertaken for the two transmission line alternatives due to their location either entirely within the Atlantis industrial area (Option 1 and part of Option 2) or their alignment adjacent to a great number of existing high voltage power lines (Option 2). The proposed power line infrastructure (i.e. 132kV monopole double circuit power lines as show in Figure 2.3) is not expected to be visually intrusive/exclusive within an industrial area with its associated industrial style infrastructure. Similarly the construction of this type of transmission power line structures, adjacent to much bulkier and visually exposed high voltage (400kV) power line structures, would not constitute a significant visual impact.

Impact table summarising the significance of visual impacts associated with the proposed 132kV power line (with and without mitigation)

Nature of Impact: Overall potential visual impact of the proposed power line The proposed power line infrastructure is not expected to be visually intrusive/exclusive within an industrial area with its associated industrial style infrastructure. Similarly the construction of this type of transmission power line structures, adjacent to much bulkier and visually exposed high voltage (400kV) power line structures, would not constitute a significant visual impact. Impacts associated with both options are expected to be similar in nature.		
	Without mitigation	**With mitigation**
Extent	Local (4)	NA
Duration	Long term (4)	NA
Magnitude	Low (2)	NA
Probability	Improbable (2)	NA
Significance	**Low (20)**	NA
Status (positive or negative)	Negative	NA
Reversibility	None	NA
Irreplaceable loss of resources?	No	NA
Can impacts be mitigated?	No	NA
Mitigation: » Avoid the unnecessary removal of vegetation for the transmission power line servitude » Limit access to the servitude (during both construction and operational phases) along existing access roads.		
Cumulative impacts: Possible cumulative visual impact should Option 2 be preferred.		
Residual impacts: NA		

5.3.5. Comparison of the power line alternative corridors identified for the 132kV power line between the Ankerlig Power Station and the Koeberg-Dassenberg line

As the visual impact of the proposed power line is expected to be low for both alternatives proposed, there is no clear preferred alternative. The shorter of the two alternatives (**Option 1**) is marginally favoured due to the fact that it is entirely located within the industrial area and due to the slight potential of Option 2 to increase the cumulative visual impact of the great number of lines already present to the west of the industrial area.

5.3.6. Conclusions and Recommendations

The *decommissioning of the units at the Acacia Power Station site* will remove the existing visual 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.

The *decommissioning of one of the units at the Port Rex Power Station site* will reduce the 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.

In both the *relocation of the aero derivative gas turbine units and the construction of the 132kV power line*, the potential visual impacts will be additional to existing visual impacts. The operation of the Ankerlig OCGT power station and the number of transmission power lines already present within the study area mitigates the potential visual impacts that would be associated with "green fields" projects.

The Ankerlig Power Station site, located within an established industrial area, is seen (from a visual impact point of view) as a suitable location for the aero derivative gas turbine units and the construction of a 132kV power line.

General visual impact mitigation measures for the proposed project include the maintenance and general appearance of the facility. These measures focus on the fact that if/when the facility is seen by outsiders; the general impression should be favourable. Timely maintenance of the gas turbine units and the general surrounds of the property (gardens, access roads, etc.) can prevent the visual impact of degradation and perceived poor management. The most notable aspect of maintenance on this type of structure is the painting of the turbine

units. In this regard and as a further mitigation to the visual impact, overtly contrasting and bright colours should be avoided. Natural hues that compliment the natural environment can soften the general appearance of the gas turbine units. The colour schemes currently utilised for the OCGT units is deemed appropriate and should be continued for the relocated gat turbine units.

Mitigation measures for the proposed 132kV power line include avoiding the unnecessary removal of vegetation for the transmission power line servitude and limiting access to the servitude (during both construction and operational phases) along existing access roads.

5.4. Assessment of Potential Impacts on Vegetation and Ecology

The study area falls within the Cape Floristic Region, a renowned botanical hotspot with a very high percentage of endemic plant species (species restricted to that area) and threatened plant species. Almost 85% of the threatened plants found in South Africa are restricted to the Cape Floristic Region. Cape Flats Dune Strandveld is the main vegetation type within the area surrounding the Ankerlig Power Station site. This vegetation type is regarded as an Endangered vegetation type in terms of the National Spatial Biodiversity Assessment (NSBA) (Rouget et al., 2004), and is restricted to the Atlantis area, the Cape Flats, and the south Peninsula.

5.4.1. Impacts associated with the decommissioning of the gas units at the Acacia and Port Rex sites

The Acacia and Port Rex power station are located on already disturbed sites. The decommissioning of the gas units at these power station sites will therefore not impact on vegetation and ecology. The existing transmission HV yard and offices at the Acacia Power Station site will not be decommissioned, and the site will continue to be used by Eskom. Therefore, no rehabilitation of the site will be required to be undertaken at this stage, as the land use will not change from the current situation.

The remaining two units at the Port Rex power Station site will remain operational. Therefore, no rehabilitation of the site will be required to be undertaken at this stage, as the land use will not change from the current situation.

5.4.2. Impacts associated with the relocation of the gas units to the Ankerlig Power Station site

The study area is located within a rapidly developing part of the south-western Cape, where much of the remaining natural vegetation is under intense

development pressure. The ecology of the power station site has been largely transformed through the construction of the existing Ankerlig Power Station. Small portions of vegetation do, however, still exist in areas not directly impacted by construction, such as the area proposed for the establishment of the gas units from the Acacia and Port Rex power station sites adjacent to Neil Hare Road (refer to Figure 5.3).

Impact tables summarising the significance of ecological impacts associated with the relocated gas units (with and without mitigation)

Nature: Permanent loss of vegetation in development footprint		
The primary direct impacts are loss of natural vegetation within the development area. All hard infrastructure will result in the permanent loss of existing vegetation, and adjacent disturbance associated with this will be medium- to long-term in nature, but the vegetation should eventually recover. The development footprint (approx 2.5ha) will result in localised loss of Cape Flats Dune Strandveld in the development area.		
	Without mitigation	**With mitigation**
Extent	Local and regional (1)	Local and regional (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Medium (5)	Low (3)
Probability	Definite (5)	Probable (3)
Significance	**Moderate (55)**	**Low (27)** – considered to be negligible
Status (positive or negative)	Negative	Neutral
Reversibility	No	No
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	Only through offset mitigation	
Mitigation: The need for on-site offsets or enhanced ecological management should be discussed with the authorities, should this be deemed necessary.		
Cumulative impacts: Yes; due to the previous developments by Eskom on the adjacent areas.		
Residual Impacts: Yes.		

Nature: Loss of ecological connectivity in area		
The proposed development area impacts negatively on existing ecological connectivity across the western Atlantis area, even though the surrounding area is already partly developed. The development of this area will have a relatively minor (Low) indirect negative ecological impact when compared to the main Ankerlig facility.		
	Without mitigation	**With mitigation**
Extent	Local & regional (1)	Local & regional (1)

Duration	Permanent (5)	Permanent (5)
Magnitude	Low (3)	Minor - low (2)
Probability	Probable (3)	Probable (3)
Significance	**Low (27)**	**Very Low (18)**
Status (positive or negative)	Negative	Negative
Reversibility	No	No
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Only through offset mitigation	
Mitigation: Biodiversity offset or enhanced ecological management proposed for direct impact will help mitigate indirect impact		
Cumulative impacts: Yes; but relatively limited		
Residual Impacts: Yes; small		

Cumulative impacts

To some extent a cumulative impact is a regional impact, rather than the local site scale impact, i.e. if something has a regional impact it also has a cumulative impact. The Atlantis to Cape Town region is a hotspot of threatened plant species (N Helme, pers. obs.), due to large scale habitat loss. Any development impacting on remaining natural vegetation in this area will thus have a cumulative negative impact. The larger the overall site impact, the larger the cumulative impact. The primary cumulative negative impact is therefore the localised loss of Endangered Cape Flats Dune Strandveld for the relocated gas units, which is proposed to be situated adjacent to the Ankerlig Power Station.

5.4.3. Impacts associated with the 132kV power line between the Ankerlig Power Station and the Koeberg-Dassenberg line and HV Yard

The proposed power line routes cross two distinct vegetation types, corresponding to different soil types. The Ankerlig plant is located within Cape Flats Dune Strandveld, an Endangered vegetation type, whereas both Options would T-off and cross an area supporting Atlantis Sand Fynbos (Vulnerable status). About 50% of the Option 2 route is regarded as being of High botanical sensitivity, and <10% of the Option 1 route is of High sensitivity. The remainder of both routes is regarded as being of Low to Medium sensitivity (refer to Figure 5.4).

Figure 5.3: Aerial photograph showing the existing Ankerlig Power Station units, the proposed power station conversion and the area proposed for the Acacia and port Rex aero derivative gas turbine units

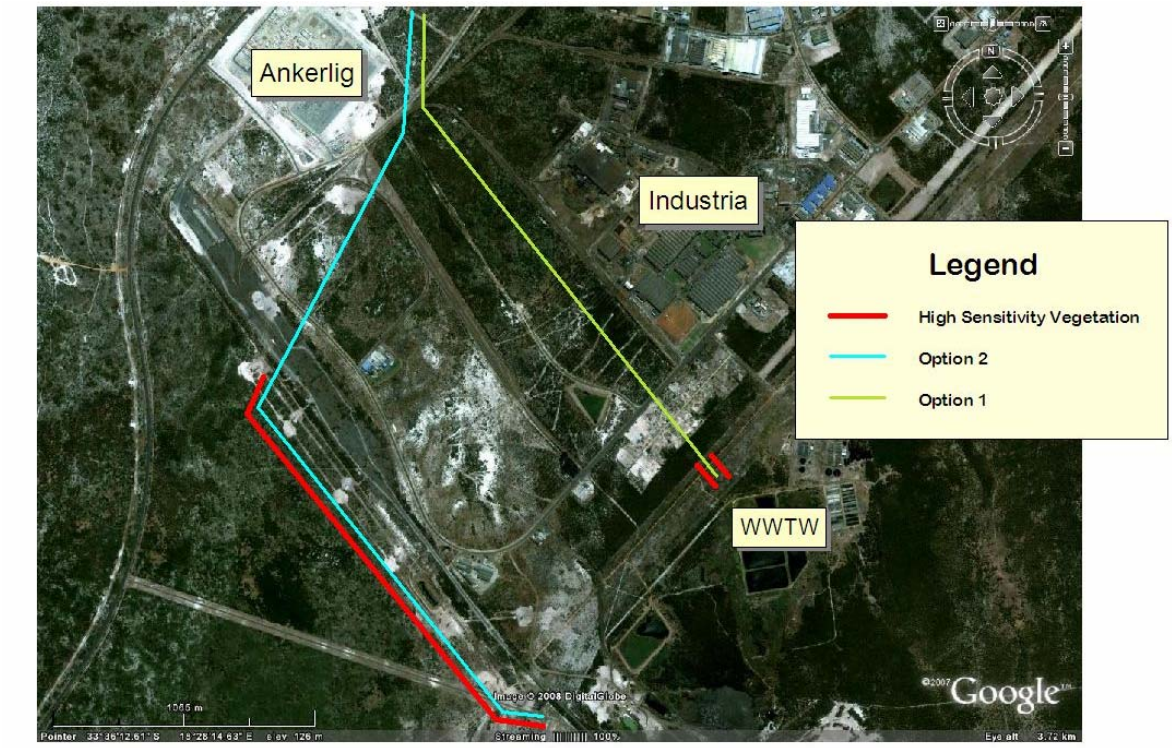

Figure 5.4: Aerial view showing approximate positions of two power line Options, and main areas of botanical sensitivity

Impacts on vegetation and ecology may be both direct and indirect, with the former occurring mostly at the construction stage and the latter mostly at the operational stage. The impacts are typically at the site scale, although the vegetation types concerned are all relatively localised (restricted to extreme South Western Cape), and all are regarded as threatened on a national basis, and thus there is also a regional and national element.

Impact tables summarising the significance of ecological impacts associated with the proposed 132kV power line (with and without mitigation)

Nature: Direct Impact - Permanent loss of natural vegetation

The primary direct impacts are loss of natural vegetation within the tower footprints, as well as potential impacts associated with the management of the servitudes, such as bushcuttting. Some temporary (long-term) loss of vegetation will also occur in the tracks required to service the power lines, even if they use existing tracks, as the track is not always in the area needed. All hard infrastructure (power line tower footings) will result in the permanent loss of existing vegetation, and adjacent disturbance associated with this will be medium- to long-term in nature, but the vegetation should eventually recover.

Regular (annual, or even up to once every four years) bushcutting eliminates numerous species and totally changes the vegetation structure, effectively turning it into a species-

poor and fire-prone grassland (N Helme, pers. obs.). Bushcutting should really not be necessary (although this is unlikely to be recognised by Eskom management) as this vegetation does not grow much taller than 1.2 m, and the fire risk is no more than in the grassy vegetation that comes to dominate in bushcut areas (N Helme, pers. obs.).

Impacts may be split into direct impacts associated with development footprints (approx. 0.4 ha of tower footprints) and a second direct impact, namely the too-frequent bushcutting of the power line servitude, but are combined for purposes of the summary below.

Option 1		
	Without mitigation	**With mitigation**
Extent	Local and regional (1)	Local and regional (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Minor (2)	Small (0)
Probability	Probable (3)	Probable (3)
Significance	**Low (24)**	**Low (18)** – considered to be negligible
Status (positive or negative)	Negative	Neutral
Reversibility	No	No
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	To a limited extent	
Option 2		
	Without mitigation	**With mitigation**
Extent	Local and regional (1)	Local and regional (1)
Duration	Permanent (5)	Permanent (5)
Magnitude	Moderate (6)	Minor (2)
Probability	Highly probable (4)	Probable (3)
Significance	**Medium (48)**	**Low (21)**
Status (positive or negative)	Negative	Neutral
Reversibility	No	No
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	To a limited extent	

Mitigation:

- Creation of new tracks must be minimised within the servitudes.
- No bushcutting may occur within the High sensitivity sections of the servitude. If it is proven essential, the maximum frequency permitted should be once every ten years.

Cumulative impacts:

To some extent a cumulative impact is a regional impact, rather than the local site scale impact, i.e. if something has a regional impact it also has a cumulative impact. The Atlantis to Cape Town region is a hotspot of threatened plant species (N Helme, pers. obs.), due to large scale habitat loss, and any development impacting on remaining natural

vegetation in this area will thus have a cumulative negative impact. The larger the overall site impact, the larger the cumulative impact. The cumulative impacts on this project are regarded as Very Low negative.

Residual Impacts:
Yes due to potential loss of sensitive species

Nature: Direct Impact - Long term but temporary loss of natural vegetation

The existing natural vegetation will be disturbed in various areas, mostly as a result of heavy machinery and heavy vehicles required to erect the power line and towers. These areas should eventually recover to a significant degree (if natural vegetation is retained in the adjacent areas), but certain species may not return for many years, due to changes in soil structure (such as compaction).

Options 1 and 2		
	Without mitigation	**With mitigation**
Extent	Local and regional (1)	Local and regional (1)
Duration	Long-term (4)	Long-term (4)
Magnitude	Minor (1)	Small (0)
Probability	Probable (3)	Probable (3)
Significance	**Low (18)**	**Low (15)** – considered to be negligible
Status (positive or negative)	Negative	Neutral
Reversibility	No	No
Irreplaceable loss of resources?	Yes	Yes
Can impacts be mitigated?	To a limited extent	

Mitigation:

- Creation of new tracks must be minimised within the servitudes.

Cumulative impacts:

To some extent a cumulative impact is a regional impact, rather than the local site scale impact, i.e. if something has a regional impact it also has a cumulative impact. The Atlantis to Cape Town region is a hotspot of threatened plant species (N Helme, pers. obs.), due to large scale habitat loss, and any development impacting on remaining natural vegetation in this area will thus have a cumulative negative impact. The larger the overall site impact, the larger the cumulative impact. The cumulative impacts on this project are regarded as Very Low negative.

Residual Impacts:
Yes due to potential loss of sensitive species

Nature: Indirect impact - Alien invasion associated with disturbance along power line

As soil disturbance encourages alien plant invasion a possible indirect impact would be increased invasion of disturbed areas by alien plants (notably *Acacia* spp), and a possible

positive impact (after mitigation) in the form of removal of invasive alien vegetation in the servitude (this would be regarded as essential mitigation).

Options 1 & 2		
	Without mitigation	**With mitigation**
Extent	Local (1)	Local (1)
Duration	Long term (4)	Temporary (1)
Magnitude	Minor (2)	Minor (2)
Probability	Highly probable (4)	Highly probable (4)
Significance	**Low (28)**	**Low (16)**
Status (positive or negative)	Negative	Positive
Reversibility	No	No
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	

Mitigation:

- Mitigation should centre on ongoing annual alien clearing within servitude, along with a policy of no bushcutting in servitude, or bushcutting at most once every 10 years.
- Ongoing, annual alien plant management must be undertaken in the High and Medium sensitivity sections of the servitudes. Methodology used must comply with DWAF methodology for control of *Acacia saligna* and *Acacia cyclops*. 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.
- Annual monitoring should be undertaken by an independent consultant to ensure that alien vegetation is being cleared appropriately from the High sensitivity areas, and to ensure that these areas are not being bushcut more than once every ten years.

Cumulative impacts:
Yes; but small

Residual Impacts:
No

5.4.4. Comparison of the power line alternative corridors identified for the 132kV power line between the Ankerlig Power Station and the Koeberg-Dassenberg line

Overall **Option 1** is significantly preferred over Option 2, as the former passes through an industrial area with little remaining natural vegetation, whereas Option 2 would run through almost 2 km of sensitive natural vegetation west of

the existing industrial area. Overall impacts prior to mitigation would be Low negative for Option 1 and Medium negative for Option 2. However, after mitigation, impacts on ecology and vegetation associated with both options would be of low significance.

5.4.5. Conclusions and Recommendations

» *Relocated gas units:*
Overall the proposed relocated gas units are likely to have a Medium to High negative impact on the vegetation at a local scale, prior to mitigation. Regional impact would be **Medium negative**, prior to mitigation. The primary negative impact is a direct, permanent loss of natural vegetation. This impact cannot be avoided, and can only be mitigated by a biodiversity offset, which is regarded as essential. In the unlikely event of an adequate offset being put in place the overall impact could be reduced to **Low positive**.

* ***Recommended Site Specific Mitigation***
  - Search and Rescue (S&R) of certain translocatable, selected succulents and bulbs occurring in the fuel storage area is recommended.
  - The need for on-site offsets should be discussed with the authorities, should this be deemed necessary.

» *132kV Power Line:*
The power line footprint itself will have only a **Low negative impact** on the vegetation, and it is more the servitude management that is important in the long term. The main negative impact in this regard is the significant impact that would result from the usual Eskom bushcutting in High sensitivity areas (mostly in Option 2), as this would cause total community change and species loss. Additional direct, permanent loss of natural vegetation would occur in pylon footprints (about 0.4 ha), and a long term but temporary impact in the track areas (up to 0.3 ha). The bushcutting impact can only be mitigated by careful and ongoing removal of all invasive alien vegetation in the servitude, and by not engaging in bushcutting in the High sensitivity areas. Bushcutting should not be necessary as this vegetation does not grow much taller than 1.2 m, and the fire risk is no more than in bushcut, grassy vegetation. Impacts for Option 1 could theoretically be reduced to Low after mitigation, and to Low negative for Option 2, but the chances of mitigation being successfully applied are considered to be low.

Additional botanical inputs at the walk down stage would add relatively little value, and are not consequently recommended.

5.5. Assessment of Potential Impacts on Terrestrial Fauna

5.5.1. Impacts associated with the decommissioning of the gas units at the Acacia and Port Rex sites

The Acacia and Port Rex power station are located on already disturbed sites. The decommissioning of the gas units at these power station sites will therefore not impact on terrestrial fauna. The existing transmission HV yard and offices at the Acacia Power Station site will not be decommissioned, and the site will continue to be used by Eskom. Therefore, no rehabilitation of the site will be required to be undertaken at this stage, as the land use will not change from the current situation.

The remaining two units at the Port Rex power Station site will remain operational. Therefore, no rehabilitation of the site will be required to be undertaken at this stage, as the land use will not change from the current situation.

5.5.2. Impacts associated with the relocation of the gas units to the Ankerlig Power Station site

The ecology (and therefore terrestrial fauna habitats) of the power station site has been largely transformed through the construction of the existing Ankerlig 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 area already disturbed by these construction activities. Therefore, the relocation of the gas units from the Acacia and Port Rex power station sites to the Ankerlig Power Station site will not impact on terrestrial fauna of the study area.

5.5.3. Impacts associated with the 132kV power line between the Ankerlig Power Station and the Koeberg-Dassenberg line and HV Yard

Originally the Atlantis Industrial area would have been vegetated by Cape Flats Dune Strandveld (on the Witsand formation sands) and marginally also Atlantis Sand Fynbos (on the Springfontyn formation sands (Mucina & Rutherford 2006). The remaining vegetation patches on the area has, however, been severely degraded and transformed due to human disturbance. Large areas are now dominated by alien plants. From a faunal perspective, the Cape Flats Dune Strandveld is probably the most sensitive habitat in the Atlantis study area.
The recently described Blouberg Dwarf Burrowing Skink (Scelotes montispectus) is associated with this habitat, as well as several other species of conservation concern (Dickson's Strandveld Copper, Gronovi's Dwarf Burrowing Skink, Kasner's Dwarf Burrowing Skink, Cape Sand Snake, Large-scaled Girdled Lizard, Silvery

Dwarf Burrowing Skink, Cuvier's Blind Legless Skink, and Austen's Thick-toed Gecko) (Mouton 2008). None of these essentially coastal species have yet been recorded to the east of the West Coast Road (R27) and it is highly unlikely that any of them will be present Atlantis Industrial area. Even if present, the erection of a power line will not significantly add to the environmental stress already being experienced by terrestrial fauna in the affected areas. Previous surveys in the same area revealed dense populations of the Cape gerbil (*Tatera afra*) in areas invaded by Port Jackson (Mouton 2008). This is not a threatened species and construction of a power line will only have short term local effects on the species, if any.

5.5.4. Comparison of the power line alternative corridors identified for the 132kV power line between the Ankerlig Power Station and the Koeberg-Dassenberg line

The two options are not expected to differ in any significant way as far as potential impact on terrestrial fauna is concerned. Therefore, there is **no preference** between the two options in terms of impacts on terrestrial fauna.

5.5.5. Conclusions and Recommendations

There do not appear to be any obvious risks to terrestrial fauna associated with the construction of a power line on the Ankerlig Power Station site. Although a number of Red Data reptile and frog species may potentially occur in the affected areas, their presence remains unconfirmed. Because of the severely degraded nature of the habitat associated with each of the route options, no argument can be presented in favour of or against any of the two options regarding their potential impact on terrestrial fauna.

5.6. Assessment of Potential Impacts on Avifauna

5.6.1. Impacts associated with the decommissioning of the gas units at the Acacia and Port Rex sites

The Acacia and Port Rex power station are located on already disturbed sites. The decommissioning of the gas units at these power station sites will therefore not impact on avifauna.

5.6.2. Impacts associated with the relocation of the gas units to the Ankerlig Power Station site

The ecology (and therefore avifauna habitats) of the power station site has been largely transformed through the construction of the existing Ankerlig 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 area already disturbed by these construction activities. Therefore, the relocation of the gas units from the Acacia and Port Rex power station sites to the Ankerlig Power Station site will not impact on avifauna of the study area.

5.6.3. Impacts associated with the 132kV power line between the Ankerlig Power Station and the Koeberg-Dassenberg line and HV Yard

The study area falls within the Fynbos biome, and the West Strandveld bioregion (Mucina & Rutherford 2006), and borders on areas of Cape Flats Dune Strandveld and Atlantis Sand Fynbos. Just east of the intersection of the R27 and the R307 there is a small patch of Cape Inland Salt Pan vegetation, coincident with a sizeable wetland area and sewage treatment plant. In terms of the avi-vegetational zones identified by the southern African bird atlas project (SABAP, Harrison et al. 1997), the area includes elements of both the Fynbos and the Succulent Karoo regions.

More specifically, the impact zone of the proposed line features five avian microhabitats, i.e. (i) Degraded/recovering Strandveld or Sand Fynbos, (ii) Alien Acacia-infested Strandveld or Sand Fynbos, (iii) Developed areas, from rural homesteads and farm buildings to light-moderate industrial development.

Due to their size and prominence, electrical infrastructures constitute an important interface between wildlife and man. Negative interactions between wildlife and electricity structures take many forms, but two common problems in southern Africa are electrocution of birds (and other animals) and birds colliding with power lines (Van Rooyen 1999, Van Rooyen & Ledger 1999). Other problems are: electrical faults caused by bird excreta when roosting or breeding on electricity infrastructure; and disturbance and habitat destruction during the construction and maintenance activities associated with electrical infrastructure.

Electrocution refers to the scenario where a bird is perched or attempts to perch on the electrical structure and causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components.

Collision refers to the scenario where a bird collides with the conductors or earth wires of overhead power lines. The groups of birds most severely impacted by collision with overhead lines are bustards, storks and cranes. These species are generally large, heavy-bodied birds with limited maneuverability, which makes it difficult for them to take the necessary evasive action to avoid colliding with power lines. An unknown number of smaller, fast-flying species – especially pursuit hunting raptors such as falcons – are also prone to colliding with power

lines. Unfortunately, many collision sensitive species are considered threatened in southern Africa, and many are long-lived, slow reproducing species poorly adapted to coping with high rates of adult mortality, inflated by power line casualties.

During the construction phase and maintenance of power lines, some **habitat destruction and alteration** inevitably takes place. This happens with the construction of access roads, the clearing of servitudes. Servitudes have to be cleared of excess vegetation at regular intervals in order to allow access to the line for maintenance, to prevent vegetation from intruding into the legally prescribed clearance gap between the ground and the conductors and to minimise the risk of fire under the line which can result in electrical flashovers. These activities have an impact on birds breeding, foraging and roosting in or in close proximity to the servitude through modification of habitat. Similarly, these activities impact on birds through disturbance, particularly during the bird's breeding activities.

Only 12 species of the total estimated avifauna reported to occur in the study area are considered susceptible to either collision with overhead lines and/or electrocution, while the majority are at least to some extent susceptible to disturbance and habitat loss. However, given the moderately to extremely disturbed and modified nature of the most of the habitat traversed by the proposed power line, none of these birds, and particularly none of the Red-listed and/or endemic species, is likely to occur within the impact zone of the proposed line with sufficient regularity or in sufficient numbers for any casualties sustained to be of real significance. Therefore, there is little if any need to implement a formal mitigation strategy beyond following industry best practice in the installation of the line.

5.6.4. Comparison of the power line alternative corridors identified for the 132kV power line between the Ankerlig Power Station and the Koeberg-Dassenberg line

There is little to choose between the two alignment options in terms of possible avian impacts. **Option 2** probably poses **marginally less collision risk** because it nests the new line with a number of existing 400 kV lines, and probably would impact less on remnant vegetation patches adjacent to and within the Ankerlig power station area than Option 1, given that it runs along the edge of the railway track before crossing the industrial area to the 132 kV yard. On this basis, **Option 2** would be the **preferred routing**.

5.6.5. Conclusions and Recommendations

The proposed link-line between the relocated Acacia and Port Rex gas turbines and the Dassenberg-Aurora 132 kV line does not traverse over any avian habitats of high conservation value. Provided that general best practice is followed in all aspects of its construction, it is unlikely to have any long-term, significant negative impacts on the local avifauna.

5.7. Potential Impacts on Heritage Sites

5.7.1. Nature and Extent of Impacts associated with the decommissioning of the gas units at the Acacia and Port Rex sites

The Acacia and Port Rex power stations are located on already disturbed sites. The decommissioning of the gas units at these power station sites will therefore not impact on any heritage sites.

5.7.2. Nature and Extent of Impacts associated with the relocation of the gas units to the Ankerlig Power Station site

The Ankerlig Power Station site has been largely transformed through the construction of the existing power station. The site proposed for the siting of the gas units was surveyed as part of the EIA process for the Gas 1 project. No sites of significance were recorded to occur in this area. Therefore, the relocation of the gas units from the Acacia Power Station site to the Ankerlig Power Station site is not expected to impact on any heritage sites.

5.7.3. Nature and Extent of Impacts associated with the 132kV power line between the Ankerlig Power Station and the Koeberg-Dassenberg line and HV Yard

In terms of the proposed activity, there is a very slight possibility that tower bases may impact the generally protected heritage material (archaeology) that could lie on the ground surface within the required servitude. The footprint size of the tower bases is minimal, so areas of potential disturbance are very small.

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. However, in general the receiving environment tends to be fairly featureless, somewhat neglected and situated well away from any scenic routes, tourist destinations or any other places of cultural significance (Hart, 2005).

Impact tables summarising the significance of impacts on heritage sites associated with the proposed 132kV power line (with and without mitigation)

Nature of impact: Impacts to cultural landscape (historical pattern of settlement) The possible impact would be visible physical disruption of the historical pattern of land-use.		
	Without mitigation	**With mitigation**
Extent	Local (1)	N/a
Duration	Long term (4)	N/a
Magnitude	Small (1)	N/a
Probability	Unlikely (2)	N/a
Significance	**Low (12)**	N/a
Status	Neutral – low negative	N/a
Reversibility	reversible	N/a
Irreplaceable loss of resources?	No	N/a
Can impacts be mitigated?	Mitigation not required	
Mitigation: No mitigation required		
Cumulative impacts: N/a		
Residual impacts: N/a		

Nature of impact: Impacts to pre-colonial archaeology caused by destruction and displacement of archaeological material but excavation of bases for towers		
	Without mitigation	**With mitigation**
Extent	Local (1)	N/a
Duration	N/a	N/a
Magnitude	N/a	N/a
Probability	Unlikely (2)	N/a
Significance	**Not significant**	N/a
Status	Neutral	N/a
Reversibility	N/a	N/a
Irreplaceable loss of resources?	No	N/a
Can impacts be mitigated?	Mitigation not required	
Mitigation: 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 the Province archaeologist (021 4839685). The person responsible for reporting any finds that evoke concern should be a senior person on site, or an environmental control officer who is on site during construction.		

Cumulative impacts:
N/a
Residual impacts:
N/a

5.7.4. Comparison of the power line alternative corridors identified for the 132kV power line between the Ankerlig Power Station and the Koeberg-Dassenberg line

It is not expected that that any one of the options has significant merit over another, however in terms of the unlikely possibility of heritage impacts, a shorter route generally means less potential for negative impact. For this reason, **Option 1** is marginally preferred over Option 2.

5.7.5. Conclusions and Recommendations

The proposed activity will take place on land that has been previously assessed and not found to be sensitive, or on land considered not to be sensitive.

» *Cultural landscape*
Given the relatively short length of the proposed options, the pre-existing industrial landscape and transmission lines combined with the relatively small profile of the 132kV towers, the proposed activity is unlikely to constitute a landscape intrusion. The significance of impacts is expected to be low.

» *Structures*
No generally protected buildings were identified in or close to either of the 2 options

» *Palaeontology*
No surface palaeontology was identified through previous surveys in or close to either of the 2 options.

» *Archaeology (pre-colonial)*
Options 1 and 2 lie on land that has been subject to previous surveys. No significant archaeological material has been found on any of these alignments.

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 the Province archaeologist (021 4839685). The person responsible for reporting any finds that evoke concern should be a

senior person on site, or an environmental control officer who is on site during construction.

Human remains can occur anywhere on the landscape. Most archaeologists retrieve several skeletons a year from various development projects around the province, so finds of this nature are not necessarily rare. Human remains are protected by several sets of legislation which means that certain protocols must be followed in the event of a find.

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.

5.8. Assessment of Potential Impacts on the Social Environment

5.8.1. Impacts associated with the decommissioning of the gas units at the Acacia site

The Acacia Power Station is located in close proximity to the residential areas of Bothasig, Edgemead and Monta Vista. Land use of the site after decommissioning and relocation of the units is expected to be commercialised and/or industrial. The transmission HV yard on the site will remain in operation, and may be extended in the future. The remainder of the site will remain in use by Eskom, possibly for use as offices. Impact on land use will thus be insignificant, and is not further addressed.

Impacts on the social environment associated with the decommissioning phase could include:

» Employment opportunities
» Intrusive impacts
» Impacts on health (Air quality)
» Impacts on traffic

Impact tables summarising the significance of social impacts associated with the decommissioning of the Acacia gas units (with and without mitigation)

Nature of Impacts: Employment Opportunities

There may be limited employment opportunities associated with the decommissioning of the Acacia units. Eskom staff will be used for the decommissioning. However, the majority of these employment opportunities are expected to require skilled personnel. Skilled people from other companies may be use for assistance. The number of unskilled casuals will be very low, if any at all. Therefore, any benefits to local communities would be limited. Limited opportunities for unskilled (de)construction labour could benefit members of the Jo Slovo township near Milnerton, which would be the closest source of unskilled labour to the Acacia site.

Eskom will use its people to decommission and to re-assemble; they may use skilled people from other companies to assist with "hands". The number of unskilled casuals will be very low, if any at all.

	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (2)
Duration	Very short (1)	Very short (1)
Magnitude	Small (0)	Low (2)
Probability	Very improbable (1)	Improbable (2)
Significance	**Low (3)**	**Low (10)**
Status	Positive	Positive
Reversibility	N/A	
Can impacts be mitigated?	Minimally	

Mitigation:
Use local casual labour where possible during decommissioning

Cumulative Impacts:
N/A

Residual Impacts:
N/A

Nature of impacts: Intrusive impacts

Intrusive impacts mainly relate to visual and noise impacts. Impacts will be very short-term during decommissioning activities and are thus not expected to have any significant impact on the nearest communities in Bothasig, Edgemead and Monta Vista. The noise impact is therefore expected to be localised and of low significance.

The Acacia Power Station currently has noise and visual impacts on surrounding communities. The decommissioning of the units at the Acacia Power Station site will remove these existing impacts from the area and is therefore expected to have a positive impact on the social environment at a local level. Impacts associated with decommissioning activities are expected to be of local extent and short duration on the nearest communities in Bothasig, Edgemead and Monta Vista. The Edgemead Residents' Association noted its support of the proposed decommissioning and relocation during the public participation process, noting it to have potentially positive impacts on residents living near the Acacia station. The existing

transmission HV yard will not be decommissioned, and therefore this positive impact is expected to be limited.		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	N/A
Duration	Very short (1)	N/A
Magnitude	Low (2)	N/A
Probability	Very improbable (1)	N/A
Significance	**Low (5)**	N/A
Status	Positive	N/A
Reversibility	N/A	N/A
Can impacts be mitigated?	N/A	
Mitigation: N/A		
Cumulative Impacts: N/A		
Residual Impacts: N/A		

Nature of impacts: Impacts on health Health impacts are mainly associated with impacts on Air Quality. The decommissioning of the units at the Acacia Power Station site will remove these impacts from the area and is therefore expected to have a positive impact on the social environment at a local level, reducing impacts on air quality that could impact on health.		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	N/A
Duration	Long (4)	N/A
Magnitude	Minor (2)	N/A
Probability	Probable (3)	N/A
Significance	**Low (24)**	N/A
Status	Positive	N/A
Reversibility	N/A	N/A
Irreplaceable loss of resources	N/A	
Can impacts be mitigated?	N/A	
Mitigation: N/A		
Cumulative Impacts: N/A		
Residual Impacts: N/A		

Nature of impacts: Local traffic impacts

Local traffic impacts are associated with decommissioning vehicles and vehicles transporting components from the Acacia Power Station site to Ankerlig Power Station site. Increase in traffic during the decommissioning phase can potentially result in the disruption of daily movement patterns for local commuters.

	Without Mitigation	**With Mitigation**
Extent	Regional (3)	N/A
Duration	Short term (2)	N/A
Magnitude	Low (4)	N/A
Probability	Highly probable (4)	N/A
Significance	**Moderate (36)**	N/A
Status	Negative	N/A
Reversibility	Impacts on road conditions and safety would extend and worsen	N/A
Irreplaceable loss of resources	N/A	
Can impacts be mitigated?	N/A	

Mitigation:
Permits for the transportation of heavy and abnormal loads should be obtained from the relevant authority prior to undertaking the activity.

Cumulative Impacts:
N/A

Residual Impacts:
N/A

5.8.2. Impacts associated with the decommissioning of the gas units at the Port Rex site

Due to the industrial nature of the area within which the Port Rex Power Station is located, impacts on the social environment are expected to be limited. Potential impacts are expected to be similar to those associated with the relocation of the units from the Acacia Power Station site as discussed above, and the impact tables are therefore not repeated here. It is important to note that 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 which may be expected may only be of a temporary nature.

As two of the three units at the Port Rex site will remain in operation at this site, the land use of the site will remain that of a power station.

5.8.3. Impacts associated with the relocation of the gas units to the Ankerlig Power Station site

The Ankerlig Power Station site is located within the Koeberg and Blaauwberg sub-councils of the City of Cape Town Metropolitan Municipality in the Western Cape Province. The population potentially affected by the development include residents of Atlantis, particularly the suburbs of Avondale, Wesfleur, Protea Park, Beacon Hill and Robinvale, and the nearby informal settlement of Witsand, situated in close proximity to the Industrial area as well as, to a lesser extent, the populations of the nearby neighbourhoods of Melkbosstrand and Duynefontein.

Potential impacts on the social environment as a result of the proposed relocation of the gas units from Acacia and Port Rex to the Ankerlig Power Station site could include:

» Employment Opportunities
» Intrusive impacts
» Impacts on Sense of Place
» Local traffic impacts
» Impact on Health and Safety
» Potential Social Investment

Impact tables summarising the significance of social impacts associated with the relocation and re-commissioning of the Acacia and Port Rex gas units to the Ankerlig Power Station site (with and without mitigation)

Nature of impacts: Employment Opportunities		
Construction: There may be limited employment opportunities associated with the relocation and commissioning of the Acacia and Port Rex units at the Ankerlig Power Station site. However, the majority of these employment opportunities are expected to require skilled personnel. Therefore, any benefits to local communities would be limited.		
	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (2)
Duration	Very short (1)	Very short (1)
Magnitude	Small (0)	Low (2)
Probability	Very improbable (1)	Improbable (2)
Significance	**Low (3)**	**Low (10)**
Status	Positive	Positive
Reversibility	N/A	
Can impacts be mitigated?	Minimally	
Mitigation:		
» Use local casual labour where possible during relocation and reassembly.		
Cumulative Impacts:		
» Any additional temporary casual/ unskilled labour used will be cumulative to current construction activities around the OCGT expansion, and potential future construction		

labour used for the proposed OCGT to CCGT conversion process.
Residual Impacts:
» The very limited number of employment opportunities that can be created by the project can result in negativity from the receiving community of Atlantis as no benefits will be seen to accrue to them.

Nature of impacts: Employment Opportunities

Operation: It is envisaged that, initially, the current production staff complement at the Acacia Power Station (approximately 15 people) would be transferred to Ankerlig to specifically operate and maintain the relocated Acacia and Port Rex units. This situation could however be reviewed in future, depending on staff requirements.

	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (2)
Duration	Long-term (3)	Long-term (3)
Magnitude	Small (0)	Low (2)
Probability	Very improbable (1)	Improbable (2)
Significance	**Low (5)**	**Low (14)**
Status	Positive	Positive
Reversibility	N/A	
Can impacts be mitigated?	Minimally	

Mitigation:

» Use local casual labour where possible during ongoing maintenance.

Cumulative Impacts:

» Any additional temporary casual/ unskilled labour used will be cumulative to current operational activities around the OCGT power station.

Residual Impacts:

» The very limited number of employment opportunities that can be created by the project can result in negativity from the receiving community of Atlantis as no benefits will be seen to accrue to them.

Nature of impacts: Intrusive impacts

Intrusive impacts mainly relate to visual and noise and air quality impacts during the construction and operational phases of the project. These are discussed in detail in separate specialist studies.

The visual impact study has noted visual impacts on the area surrounding Atlantis to be of minimal significance, as the relocated units will be obscured by existing developments at the site.

Noise and air quality assessments could not be obtained in time for review to be considered in this assessment.

	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (2)
Duration	Long (4)	Long (4)
Magnitude	Low (4)	Small (0)
Probability	Probable (3)	Very improbable (1)

Significance	**Low / Moderate (30)**	**Low (4)**
Status	Negative	Negative
Reversibility	No	
Irreplaceable loss of resources	No	
Can impacts be mitigated?	Yes	
Mitigation: » Mitigate for visual and air quality impacts as proposed in relevant specialist studies.		
Cumulative Impacts: » Impacts can be considered cumulative to existing and future developments at the Ankerlig site.		
Residual Impacts: N/A		

Nature of impacts: Impacts on sense of place

As the gas units from Acacia and Port Rex are proposed to be relocated to the existing Ankerlig Power Station site in the Atlantis Industrial Area, impact on sense-of place can be expected to be limited. To the extent that such impacts may occur, their significance would relate largely to other impacts, notably visual and noise impacts, as well as impacts on air quality and traffic volumes, both during construction and operation of the re-commissioned units, which need to be taken into consideration in assessing this impact.

It is also important to note that the Atlantis community already perceives itself as vulnerable to a variety of developments which many feel are being 'dumped' on them. The impact on sense of place can thus be regarded as a cumulative psychological impact, whereby Atlantis residents increasingly feel victim to broader developments in which they have no say or control potentially impacting on them.

Conversely, if Eskom's presence can be seen to have visible benefits to local communities in terms of job creation, business opportunities, skills development and social investment, perceptions of the area as an 'energy hub' for South Africa may acquire a positive connotation which could change the status of this impact.

	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (2)
Duration	Medium (3)	Short (1)
Magnitude	Moderate (6)	Minor (2)
Probability	Probable (3)	Very improbable (2)
Significance	**Moderate(33)**	**Low (10)**
Status	Negative	Negative/ Positive
Reversibility	"Sense of place" essentially alters over time. Ankerlig is situated in an industrial area in a region increasingly characterised by industrial and power developments (Atlantis Industria, Gas turbines and areas located near the site like Koeberg, Nuclear, PBMR etc.) This eventually becomes part of the area's 'sense of place'	
Can impacts be mitigated?	Yes	

Mitigation:

» Minimise noise, visual, air quality, traffic impacts through appropriate mitigation as proposed in relevant specialist studies for this assessment, as well as for the assessment for the proposed conversion of OCGT units at Ankerlig to CCGT units.

» Maintain good relationships with local communities through regular, inclusive stakeholder engagement and consultation processes.

» Maximise local benefit through specific focus on social investment, as other opportunities to benefit, through for example employment creation, will be minimal.

Cumulative Impacts:

» Cumulative psychological impact, whereby Atlantis residents increasingly feel victim to broader developments in which they have no say or control potentially impacting on them.

Residual Impacts:

» Perceiving one's home to be a 'dumping ground' for developments can have detrimental psychological impacts on the local population, particularly if they do not feel appropriately known in these developments through effective public engagement processes

Nature of impacts: Local traffic impacts

Local traffic impacts are associated with construction vehicles and vehicles transporting components from the Acacia Power Station site to Ankerlig Power Station site. Increase in traffic during the construction phase can potentially result in the disruption of daily movement patterns for local commuters.

The issue of potential impacts of transporting additional fuel required for the relocated units to the site, which was noted as a significant concern for the proposed conversion of nine OCGT units to CCGT, was raised again during the public participation process for this EIA. Impacts associated with additional fuel transportation to the Ankerlig site for the Acacia and Port Rex units, are not however considered significant as there will be limited storage on site for these units – 1 million litres (in addition to the 59.4 million litres of fuel to be stored for the nine OCGT units converted to CCGT units at the Ankerlig site).

Eskom is in the process of investigating alternative modes of fuel transportation and is currently undertaking an EIA to this effect. (Comments and Response Report, July 2008).

	Without Mitigation	**With Mitigation**
Extent	Widespread (3)	Local (2)
Duration	Long (4)	Medium (3)
Magnitude	Moderate (6)	Minor (2)
Probability	Highly probable (4)	Probable (3)
Significance	**Moderate (52)**	**Low (21)**
Status	Negative	Negative
Reversibility	Impacts on road conditions and safety could extend and worsen	Impacts on roads and traffic minimised
Irreplaceable loss of resources	No	
Can impacts be mitigated?	Yes	

Mitigation:

» Implement mitigation measures proposed in the traffic assessment for the OCGT-CCGT conversion at Ankerlig

» Identify alternate means of transporting fuel to site.

Cumulative Impacts:

» Though additional impacts of fuel transportation are expected to be minimal, these should be considered cumulative to impacts of additional fuel transportation for the current and potentially converted gas turbine units at Ankerlig.

Residual Impacts:

N/A

Nature of Impacts: Impacts on health and safety

Concerns have been expressed throughout previous public participation processes for the Ankerlig Power Station regarding potential health and safely implications that may result from potential impacts on air quality during operation, and transportation and storage of fuel.

The units from Acacia and Port Rex would be serviced before they are relocated to the Ankerlig site. Fuel tanks will be designed to match the aesthetics of the Ankerlig site and comply with the highest standards for fuel storage.

	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (2)
Duration	Long (4)	Long (4)
Magnitude	Moderate (6)	Small (0)
Probability	Probable (3)	Improbable (2)
Significance	**Moderate (36)**	**Low (12)**
Status	Negative	Negative
Reversibility	See relevant specialist studies	
Irreplaceable loss of resources	N/A	
Can impacts be mitigated?	Yes	

Mitigation:

» Implement mitigation proposed in Air Quality Assessment for this assessment, and the Risk and Traffic assessments for the proposed CCGT conversion

» The contingency safety plan outlined in the EMP to be adhered to.

Cumulative Impacts:

» Potential cumulative impacts of additional fuel storage and emission above what was anticipated as assessed in specialist studies.

Residual Impacts:

» If mitigation measures and safety plans are not successfully implemented, Eskom will be seen as a "bad neighbour", and negative attitude towards future projects could jeopardise these

Nature of Impacts: Social Investment

As the number of employment opportunities that will be created during both the construction and operational phases of the project will be limited, it will be necessary to augment the benefits for surrounding communities by implementing appropriate social investment activities.

Social development is implemented through the Eskom Development Foundation (ESDEF). Eskom Development Foundation is a Section 21 company and a wholly owned subsidiary of Eskom. The Development Foundation is responsible for: initiating and evaluating CSI related projects; coordinating and integrating Eskom's corporate social investment (CSI) activities, and developing grants and donations in South Africa.

	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (3)
Duration	Short (2)	Medium (3)
Magnitude	Minor (2)	High (8)
Probability	Probable (3)	Highly probable (4)
Significance	**Low (18)**	**Moderate (56)**
Status	Positive	Positive
Reversibility	Sustainability of social development initiatives will depend on the manner in which these are identified and implemented.	
Can impacts be mitigated?	Yes - this impact can be optimised.	

Mitigation:

» Ensure appropriate communication channels to disseminate information about the types of assistance available through ESDEF in the community, through initiatives such as Red Door, the LED forum, and Local Council.
» Eskom to take a more pro-active stance in assisting community members to take advantage of its assistance through effective consultation with stakeholders on opportunities for assistance and how to access it.

Cumulative Impacts:

» Any increased emphasis on social investment due to ongoing developments in the area would have a positive impact on surrounding communities benefiting.

Residual Impacts:

» Improved relationship between Eskom and local communities.

5.8.4. Impacts associated with the 132kV power line between the Ankerlig Power Station and the Koeberg-Dassenberg line and HV yard

Potential impacts on the social environment as a result of the proposed construction of the 132kV power line could include:

» Employment Opportunities
» Intrusive impacts

Impact tables summarising the significance of social impacts associated with the 132kV power line (with and without mitigation)

Nature of impacts: Employment Opportunities during construction

Limited temporary employment opportunities will be created during construction of the transmission line. No information regarding the potential number of jobs to be created could be obtained from Eskom. This impact can be expected similar for both Options 1 and 2, which are under consideration.

	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (2)
Duration	Very short (1)	Medium (3)
Magnitude	Small (0)	Minor (2)
Probability	Improbable (2)	Probable (3)
Significance	**Low (6)**	**Low (21)**
Status	Positive	Positive
Reversibility	Positive impact for duration of employment.	Ongoing positive impact.
Irreplaceable loss of resources	No	
Can impacts be mitigated?	Yes - can be optimised.	

Mitigation:

» Local labour and suppliers should be used as far as possible for construction, as well as ongoing maintenance, service provision and any additional opportunities arising during the construction and operational phases

Cumulative Impacts:

» Any employment opportunities created would be a positive cumulative impact to existing developments. Longer involvement in the area provides additional opportunity to identify and train local people for possible employment, as well as maintenance and provision of general services required.

Residual Impacts:

» The families of those who secure work will benefit and this will impact on their health and well-being. Impacts on these households will be significant as these are permanent job opportunities created.

Nature of impacts: Employment Opportunities during operation

Limited temporary employment opportunities will be created during operation of the transmission line. No information regarding the potential number of jobs to be created could be obtained from Eskom. This impact can be expected similar for both Options 1 and 2, which are under consideration.

	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (2)
Duration	Long short (3)	Long-term (3)
Magnitude	Small (0)	Minor (2)
Probability	Improbable (2)	Probable (3)
Significance	**Low (10)**	**Low (21)**

Status	Positive	Positive
Reversibility	Positive impact for duration of employment.	Ongoing positive impact.
Irreplaceable loss of resources	No	
Can impacts be mitigated?	Yes - can be optimised.	

Mitigation:

» Local labour and suppliers should be used as far as possible for operation and maintenance, service provision and any additional opportunities arising during the construction and operational phases

Cumulative Impacts:

» Any employment opportunities created would be a positive cumulative impact to existing developments. Longer involvement in the area provides additional opportunity to identify and train local people for possible employment, as well as maintenance and provision of general services required.

Residual Impacts:

» The families of those who secure work will benefit and this will impact on their health and well-being. Impacts on these households will be significant as these are permanent job opportunities created.

Nature of impacts: Intrusive impacts

These relate mainly to potential visual impacts, which, according to the visual impact assessment, are considered negligible for both options.

	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (2)
Duration	Short (2)	Short (2)
Magnitude	Minor (2)	Small (0)
Probability	Improbable (2)	Very improbable (1)
Significance	**Low (12)**	**Low (4)**
Status	Negative	Negative
Reversibility	No	
Irreplaceable loss of resources	No	
Can impacts be mitigated?	Yes	

Mitigation:

» Mitigation for impacts in broader region to consider recommendations made in visual and air quality specialist studies.

Cumulative Impacts:

N/A

Residual Impacts:

N/A

5.8.5. Comparison of the power line alternative corridors identified for the 132kV power line between the Ankerlig Power Station and the Koeberg-Dassenberg line

The construction of the proposed 132kV power line is not expected to have any significant social impacts. Both Option 1 and Option 2 can be considered as feasible alternatives from a social perspective. Therefore, there is **no preference** from a social perspective.

5.8.6. Conclusions and Recommendations

Impacts associated with the decommissioning of the gas units at both Acacia and Port Rex power stations 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 will remove this existing impact from the area and is therefore expected to have a positive impact on the local environment.

Potential social impacts on the population of Atlantis and surrounding areas can be considered cumulative to those experienced as result of the existing OCGT units, additional units currently under construction, and the planned conversion of these units to CCGT units. These include the possibility of limited positive impacts of possible casual labour used during construction, and the possibility of increased social investment, and potential negative impacts on 'sense of place' resulting from the perception of the area being used as an electricity generation hub, without sufficient benefits accruing to the host community of Atlantis.

While the relocation of units from Acacia and Port Rex is considered the preferred social alternative from a broader social perspective, it is important that cumulative impacts on the receiving community of Atlantis be considered, and appropriate mitigation applied. This can most effectively be done by maximising social benefit through an increased focus on social investment in the area.

5.9. Nomination of Preferred Power Line Alternative

From the assessment of the alternative power line alternatives, **Option 1** is considered to be the alternative which would result in the lower impact on the environment. Both options are, however, considered to be feasible from an environmental perspective.

CONCLUSIONS AND RECOMMENDATIONS CHAPTER 6

In order to stabilise the transmission network in the area and ensure the required dedicated back-up power supply to the Koeberg Nuclear Power Station, Eskom Holdings is, investigating the decommissioning of the existing three (3) Acacia and one (1) Port Rex aero derivative gas turbine units and the relocation of these units to the existing Ankerlig Power Station site in Atlantis.

Eskom is also proposing to turn the existing Koeberg-Dassenberg 132 kV line into Ankerlig and to utilise this dedicated line to connect the aero derivative gas turbines to Koeberg, connected to a new 132kV HV yard adjacent to the HV yard within the existing Ankerlig Power Station site.

The EIA for the proposed project has been undertaken in accordance with the EIA Regulations published in Government Notice 28753 of 21 April 2006, in terms of Section 24(5) of NEMA (Act No 107 of 1998).

The EIA Phase aimed to achieve the following:

» Provide an overall assessment of the social and biophysical environments affected by the proposed alternatives put forward as part of the project.
» Assess potentially significant impacts (direct, indirect and cumulative, where required) associated with the proposed project.
» Comparatively assess identified alternatives put forward as part of the project.
» Nominate a preferred power line alternative corridor for consideration by the decision-making authorities (i.e. DEAT, DEA&DP and DEDEA).
» Identify and recommend appropriate mitigation measures for potentially significant environmental impacts.
» Undertake a fully inclusive public involvement process to ensure that I&APs are afforded the opportunity to participate, and that their issues and concerns are recorded.

The conclusions and recommendations of this EIA are the result of the assessment of identified impacts by specialists, and the parallel process of public participation. The public consultation process has been extensive and every effort has been made to include representatives of all stakeholders in the study area.

6.1. Evaluation of the Proposed Project

The preceding chapters of this report together with the specialist studies contained within Appendices E - K provide a detailed assessment of the environmental impacts on the social and biophysical environment as a result of the proposed project. This chapter concludes the EIA process by providing a summary of the conclusions of the assessment of the proposed decommissioning and relocation of the gas units and the 132kV power line. In so doing, it draws on the information gathered as part of the EIA process and the knowledge gained by the environmental consultants during the course of the EIA and presents an informed opinion of the environmental impacts associated with the proposed project.

6.1.1. Conclusions and Recommendations drawn from the Assessment of the Proposed Decommissioning and Relocation of the gas units from the Acacia and Port Rex Power Stations to the Ankerlig Power Station site

In general, impacts associated with the decommissioning of the gas units at both the Acacia and Port Rex power station sites are expected to be localised in the short-term. The power station units currently have 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.

The decommissioning of one of the units at the Port Rex Power Station site will reduce the 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.

Once decommissioned, the existing gas units from the Acacia and Port Rex power station sites will be relocated to the existing Ankerlig Power Station site near Atlantis where they will be re-commissioned. 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 and re-commissioning of the units are expected to occur during both the construction and operational phases. New impact sources associated with the relocation and re-commissioning of these units are expected to be cumulative at a local level and would mainly include:

» **Air quality impacts** associated with the construction phase (dust) and the operational phase (emissions from the gas units). Impacts associated with the construction phase are expected to be restricted to the power station site and of low significance. The relocation of the Acacia and Port Rex units will have a high impact on the existing air quality of the area. The introduction of mitigation measures in the form of utilisation of diesel as a fuel source instead of kerosene (as is currently the case for the Ankerlig Power Station units) will reduce the impact to one of moderate significance.

» **Noise impacts** associated with the gas units. The relocation of the Acacia and Port Rex Power Station units will have only a local impact around the north-western boundary when compared to the open cycle levels, increasing the noise levels by 3 dBA. The Acacia and Port Rex units will not have any significant cumulative effect on the noise-sensitive receptors of Atlantis, since the increase above the closed cycle noise levels in the Avondale and Protea Park areas will be below 0.3 dBA. The cumulative impact of the proposed combined cycle units can potentially have a significant effect on the existing noise levels around the power station site. The introduction of substantial mitigation measures, however, can reduce these levels to the ones generated by only the open cycle units. The overall noise impact due to the relocation of the Acacia and Port Rex units, assuming the same enclosures will be utilised and taking into consideration the resulting noise levels in the noise-sensitive area of Atlantis, was found to be Low.

» **Visual impacts** as a result of the additional gas unit infrastructure and 132kV HV yard on the site. The potential visual impacts will be additional to existing visual impacts and is expected to be of **moderate significance**. The envisaged visual impact of the four aero derivative gas turbine units are not as significant as would be the case if this had been a "greenfields" development site.

» **Ecological impacts** at a localised level as a result of the relocated gas units. The ecology of the power station site has been largely transformed through the construction of the existing Ankerlig Power Station. Small portions of vegetation do, however, still exist in areas not directly impacted by construction, such as the area proposed for the establishment of the gas units from the Acacia and Port Rex power station sites adjacent to Neil Hare Road. The primary negative impact is a direct, permanent loss of natural vegetation. This impact cannot be avoided, and can only be mitigated by a biodiversity offset, which is regarded as essential. Potential impacts are expected to be of **moderate to low** significance without mitigation.

» **Impacts on the social environment**. Potential social impacts on the population of Atlantis and surrounding areas can be considered cumulative to

those experienced as result of the existing OCGT units, additional units currently under construction, and the planned conversion of these units to CCGT units. These include the possibility of limited positive impacts of possible casual labour used during construction, and the possibility of increased social investment, and potential negative impacts on 'sense of place' resulting from the perception of the area being used as an electricity generation hub, without sufficient benefits accruing to the host community of Atlantis.

While the relocation of units from Acacia and Port Rex is considered the preferred social alternative from a broader social perspective, it is important that cumulative impacts on the receiving community of Atlantis be considered, and appropriate mitigation applied. This can most effectively be done by maximising social benefit through an increased focus on social investment in the area.

Table 6.1: Summary of impacts associated with the relocation and re-commissioning of the Acacia and Port Rex units at the Ankerlig Power Station site

Issue	Significance without mitigation	Significance with mitigation
Air quality impacts (construction)	Low	Low
Air quality impacts (operation)	Moderate	Moderate
Noise impacts (construction)	Low	Low
Noise impacts (operation)	Low	Low
Visual impacts	Moderate	N/A
Impacts on vegetation and ecology – permanent loss of natural vegetation	Moderate	Low
Impacts on vegetation and ecology – loss of ecological connectivity	Low	Very low
Impacts on terrestrial fauna	None	None
Impacts on the social environment	Moderate to low (positive & negative)	Moderate to low (positive & negative)

6.1.2. Conclusions and Recommendations drawn from the Assessment of the Proposed 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 are typically at the

site scale, and are expected to be of **low significance** due to the largely disturbed nature of the vegetation and habitats in the area.

» **Impacts on avifauna** as a result of collisions with the earthwire, electrocution and disturbance of habitats within the power line servitude. Impacts are expected to be of **low to no significance** due to the power line structure to be used (which poses little threat of collision and electrocution), as well as the largely disturbed nature of the environment.

» **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 are expected to be of **low significance** due to the location of the proposed power line within an industrial area and in close proximity to other power line infrastructure.

» **Impacts on the social environment** as a result of the creation of employment opportunities, impacts on land use, and impacts on sense of place. Impacts are expected to be both positive and negative, and of **low significance**.

Table 6.2: Summary of impacts associated with the construction and operation of the proposed 132kV power line

Issue	Significance without mitigation	Significance with mitigation
Visual impacts (options 1 & 2)	Low	N/A
Impacts on vegetation and ecology – permanent loss of natural vegetation (option 1)	Low	Low
Impacts on vegetation and ecology – permanent loss of natural vegetation (option 2)	Moderate	Low
Impacts on vegetation and ecology - Long term but temporary loss of natural vegetation (options 1 & 2)	Low	Low
Impacts on vegetation and ecology - Alien invasion associated with disturbance along power line (options 1 & 2)	Low	Low (positive)
Impacts on terrestrial fauna – construction phase (options 1 & 2)	Low	Low
Impacts on terrestrial fauna – operation phase (options 1 & 2)	Low to none	Low to none
Impacts on avifauna - construction phase (options 1 & 2)	Low to none	Low to none
Impacts on avifauna - operation phase (options 1 & 2)	Low to none	Low to none
Impacts on heritage sites - Impacts to	Low	N/A

Issue	Significance without mitigation	Significance with mitigation
cultural landscape (options 1 & 2)		
Impacts on heritage sites - Impacts to pre-colonial archaeology caused by destruction & displacement of archaeological material but excavation of bases for towers(options 1 & 2)	None	N/A
Impacts on the social environment	Low (positive and negative)	Low (positive and negative)

From the assessment of the alternative power line alternatives, **Option 1** is considered to be the alternative which would result in the lower impact on the environment. Both options are, however, considered to be feasible from an environmental perspective.

6.2. Overall Conclusion (Impact Statement)

The findings of the specialist studies undertaken within this EIA to assess both the benefits and potential negative impacts anticipated as a result of the proposed project conclude that:

» There are no environmental fatal flaws that should prevent the proposed project from proceeding on the identified site.
» From the assessment of the alternative power line alternatives, **Option 1** is considered to be the alternative which would result in the lower impact on the environment. Both options are, however, considered to be feasible from an environmental perspective.
» The significance levels of the majority of identified negative impacts can be minimised by implementing the recommended mitigation measures.

6.3. Overall Recommendation

Based on the nature and extent of the proposed project, the local level of disturbance predicted, the findings of the EIA, and the understanding of the significance level of potential environmental impacts, it is the opinion of the EIA project team that the application for the proposed decommissioning, relocation and re-commissioning of three aero-derivative gas units from Acacia Power Station and one aero-derivative gas units from Port Rex Power Station to the Ankerlig Power Station, and the associated 132kV power line be authorised by DEAT.

The following conditions of this recommendation must be included within the Environmental Authorisation if approved by DEAT:

- All mitigation measures detailed within this report and the specialist reports contained within Appendices E to K must be implemented.
- The draft Environmental Management Plan (EMP) as contained within Appendix N of this report should form part of the contract with the Contractors appointed to undertake the decommissioning, relocation and re-commissioning activities associated with the project, and will be used to ensure compliance with environmental specifications and management measures. The implementation of this EMP for all life cycle phases of the proposed project is considered to be key in achieving the appropriate environmental management standards as detailed for this project.
- Applications for all other relevant and required permits required to be obtained by Eskom must be submitted to the relevant regulating authorities. This includes permits for the transporting of all components (abnormal loads) to site, disturbance to heritage sites, disturbance of protected vegetation, and disturbance to any riparian vegetation or wetlands.
- During construction, unnecessary disturbance to habitats should be strictly controlled and the footprint of the impact should be kept to a minimum.
- The need for on-site offsets or enhanced ecological management should be discussed with the authorities, should this be deemed necessary
- The process of communication and consultation with the community representatives must be maintained after the closure of this EIA process, and, in particular, during the construction phase associated with the proposed project.

REFERENCES CHAPTER 7

Afrosearch, 2005. Social Impact Assessment for the proposed Open Cycle Gas Turbine Power Plant at Atlantis. Prepared for: Bohlweki Environmental

Bohlweki Environmental (2005) Environmental Scoping Report for a Proposed Open Cycle Gas Turbine (OCGT) Power Station and Associated Transmission Lines and Substation at a Site within the Atlantis Industrial Zone, Western Cape. July 2005

Bohlweki Environmental (2007) Environmental Impact Assessment Report for the Proposed Capacity Expansion of the Existing Open Cycle Gas Turbine (OCGT) Plant and Associated infrastructure at Atlantis, Western Cape. March 2007

DEAT, 1992. Noise Control Regulations (Section 25). Environmental Conservation Act 73 of 1989. Gov. Gaz. No. 13717, 10 January 1992.

DEAT, 2006. Government Gazette, National Environmental Management Air Quality Act, 2004, No. 28899.

DDA (2008) Conversion of the Atlantis Power Station Open Cycle Gas Turbine (OCGT) Units to Combined Cycle Gas Turbine (CCGT) units: Air Pollution and Noise Impact Assessment: Scoping. January 2008

Environment Conservation Act, 1989 (Act 73 of 1989). Noise Control Regulations.

EWT (2008) Bird Impact Assessment Study (Scoping Phase): Proposed 400kV power line between Ankerlig power station and Omega Substation, Western Cape Province, January 2008

EWT (2007) Eskom Generation Wind Energy Facility – Western Cape. Avifaunal Impact Assessment.

Hart, T (2005) Atlantis Open Cycle Gas Turbine Project: A Heritage Scoping Assessment of Farm 1183 and a Portion of Farm Witzand 2, Atlantis Industrial Area. April 2005.

Helme (2008) Botanical Assessment of Proposed New 400kV Power Line: Ankerlig – Omega. January 2008

Jongens (2005) Environmental Noise Impact Assessment for a Proposed Open Cycle Gas Turbine Power Plant at Atlantis. September 2005

MetroGIS (2008) Ankerlig Power Station Conversion and Transmission Integration Project Visual Assessment - Input for Scoping Report and Transmission Power Line Alternative Selection. January 2008

Rouget, M., Reyers, B., Jonas, Z., Desmet, P., Driver, A., Maze, K., Egoh, B. & Cowling, R.M. 2004. South African National Spatial Biodiversity Assessment 2004: Technical Report. Volume 1: Terrestrial Component. South African National Biodiversity Institute, Pretoria.