PROJECT DETAILS

DEAT Reference No.	:	12/12/20/1014 (power station conversion) 12/12/20/1037 (transmission power line)
Title	:	Environmental Impact Assessment Process Final Scoping Report: Proposed Ankerlig Power Station Conversion and Transmission Integration Project, Western Cape Province
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Client	:	Eskom Holdings Limited (Eskom Generation Division)
Report Status	:	Final Scoping Report

When used as a reference this report should be cited as: Savannah Environmental (2008) Final Scoping Report: Proposed Ankerlig Power Station Conversion and Transmission Integration Project, Western Cape Province

PURPOSE OF THE SCOPING REPORT

Eskom Holdings Limited (Eskom) is investigating the conversion of the nine Open Cycle Gas Turbine (OCGT) units planned to be installed at the existing Ankerlig Power Station (located in Atlantis Industria) plant to a Combined Cycle Gas Turbine (CCGT). This will increase the generating capacity of this existing power station by approximately 720 MW. The proposed conversion involves the addition of steam turbines to the existing gas turbine plant, and will be established on the same site as the existing Ankerlig Power Station.

Eskom is also proposing the construction of a 400kV transmission power line between the Ankerlig Power Station and the already authorised Omega Substation (to be located on the Farm Groot Oliphantskop 81) to integrate the additional power generated at Ankerlig Power Station into the national electricity grid.

Eskom has appointed Savannah Environmental, as independent environmental consultants, to undertake the EIA. The EIA process is being undertaken in accordance with the requirements of the National Environmental Management Act (NEMA; Act No. 107 of 1998).

This Scoping Report represents the outcome of the Scoping Phase of the EIA process and contains the following sections:

Chapter 1 provides background to the proposed power station conversion and transmission integration project and the environmental impact assessment process.
Chapter 2 provides the strategic context for energy planning in South Africa.
Chapter 3 describes the components of the proposed project (project scope).
Chapter 4 outlines the process which was followed during the Scoping Phase of the EIA process, including the consultation program that was undertaken and input received from interested parties.
Chapter 5 describes the existing biophysical and socio-economic environment.
Chapter 6 presents the evaluation of environmental impacts associated with the power station conversion.
Chapter 7 presents the evaluation of environmental impacts associated with the proposed transmission power line.
Chapter 8 presents the conclusions of the scoping evaluation.
Chapter 9 describes the Plan of Study for EIA.
Chapter 10 provides a list of references and information sources used in undertaking the studies for this Draft Scoping Report.

This Final Scoping Report documents the outcome of the Scoping phase studies of the EIA process, and contains the following:

- An overview of the proposed project and a description of the feasible alternatives considered;
- A description of the environmental issues identified and evaluation of the potential impacts associated with the proposed project;
- Issues, concerns and suggestions raised by stakeholders to date;
- Scoping and nomination of preferred alternatives for all components of the project; and
- A description of the scope of the environmental impact assessment phase.

PUBLIC REVIEW OF THE DRAFT SCOPING REPORT

The Draft Scoping Report has been made available for public review at the following public places in the project area from 21 January 2008 to 21 February 2008 at the following locations:

- www.eskom.co.za/eia
- www.savannahSA.com
- Wesfleur Library
- Atlantis Residents and Ratepayers Association office
- Red Door Local LED Office
- Atlantis Development Forum Office
- Avondale Library
- Melkbosstrand Residents and Ratepayers Association
- Melkbostrand Library

In accordance with the EIA Regulations, a primary purpose of the Draft Scoping Report which was made available to the public for review was to provide stakeholders with an opportunity to verify that the issues raised had been captured and considered within the study, and to provide the opportunity to raise any additional key issues for consideration. Comments were requested to be submitted to Sustainable Futures ZA by 21 February 2008 as written submission via fax, post or e-mail. In order to facilitate comments on the Draft Scoping Report, a public meeting and a stakeholder workshop were held during the review period. The aim of these meetings was to provide feedback of the findings of the environmental scoping studies undertaken, and to invite comment on the proposed project.

This Final Scoping Report has incorporated all issues and responses from stakeholders prior to submission to the National Department of Environmental Affairs and Tourism (DEAT), the decision-making authority for the project.

SUMMARY

Background and Project Overview

As part of its plans for increased electricity supply options, Eskom is proposing the **conversion of the nine OCGT units** installed and being installed at the existing Ankerlig Power Station to Combined Cycle Gas Turbine (CCGT) units. This conversion would increase the generating capacity of the Ankerlig Power Station by approximately 720 MW by increasing the efficiency of the gas turbine plant (i.e. more power generated and sent out, for the same amount of fuel used). Overall thermal efficiency would therefore be increased from approximately 34% for the current OCGTs to approximately 50% to 55% for the proposed CCGT plant, depending on the operating regime of the plant.

Electricity cannot be readily or inexpensively stored and must be used as it is generated. It is, therefore, required that electricity must be efficiently transmitted from the point of generation to the end user. It is vital that transmission capacity keeps up with both electricity generation capacity and electricity demand.

Therefore, in order to integrate the additional power generated at the Ankerlig Power Station into the national electricity grid, the **construction of a new 400kV transmission power line** between the Ankerlig Power Station and the Omega Substation would be required.

The Ankerlig Power Station conversion & associated transmission integration project can be seen as a third phase of the original Atlantis OCGT power station project. The construction of the initial OCGT units (i.e. the four units now in operation) was the first phase of the project. The second phase of the project (currently under construction) involves the expansion (capacity increase) of the power station by adding another five OCGT units, four fuel tanks and a switchyard to the power station.

The primary components of the conversion project include the following:

» A **heat recovery steam generator** (HRSG) would be added to the gas turbine to recover waste heat, to drive the steam turbine cycle.
» A **condenser** which converts exhaust steam from the steam turbine back into water through a cooling process.
» Depending on the configuration, a **bypass stack** for the CCGT, anticipated to be approximately 60 m in height would be associated with each HRSG.
» **Water treatment plant** for treatment of potable water and production of demineralised water (for steam generation). A **waste disposal system** for the effluent from this water

treatment system will be required.

» **Dry-cooled technology** consisting of a system of air-cooled condenser fans situated in fan banks approximately between 25-30 m above ground.
» **Additional fuel storage facilities** and associated off-loading and other related infrastructure to cater for the increased fuel requirements associated with the higher load factor (i.e. longer operating hours or a mid-merit operating regime).
» An **elevated water tank**, approximately 20 m high, with a holding volume of approximately 2.5 million litres (i.e. water storage for approximately 5 days of operation).

The nature and extent of the power station conversion and transmission integration project, as well as potential environmental impacts associated with the construction of a facility of this nature is explored in more detail in the Scoping Report.

Environmental Impact Assessment

The proposed power station conversion & associated transmission integration project is subject to the requirements of the Environmental Impact Assessment Regulations (EIA Regulations) published in 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 numbers 12/12/20/1014 (power station conversion) and 12/12/20/1037 (transmission power line)). Through the decision-making process, DEAT will be supported by the Western Cape Department of Environmental Affairs and Development Planning (DEA&DP).

The scoping phase for the proposed project forms part of the EIA process and has been undertaken in accordance with the EIA Regulations. The Scoping Report aimed to identify potential issues associated with the proposed project, and define the extent of studies required within the EIA. This was achieved through an evaluation of the proposed project involving specialists with expertise relevant to the nature of the project and the study area, the project proponent, as well as a consultation process with key stakeholders that included both relevant government authorities and interested and affected parties (I&APs).

A comprehensive public participation process was undertaken in accordance with Regulation 56 of Government Notice 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.

Evaluation of the Proposed Power Station Conversion

Potential impacts associated with the proposed power station conversion project are expected to occur during both the construction and operational phases. In general, impacts would be expected to be similar to those associated with the initial phases of the power station project (i.e. the initial 4 OCGT units currently in operation, and the additional 5 OCGT units currently under construction). New impact sources associated with the power station conversion project would include:

» **Visual impacts** as a result of the additional infrastructure associated with the conversion project to be added onto the existing power station.
» **Air quality impacts** associated with the construction phase (dust) and the operational phase (emissions from the power station).
» **Noise impacts** associated with the existing OCGT units as well as the additional CCGT components to be added onto the existing power station.
» Potential **impacts on biodiversity** associated with the additional fuel storage area.
» **Impacts on the social environment** as a result of the creation of employment opportunities, influx of workers to the area, traffic movements, and impacts on sense of place.
» **Traffic and transportation impacts associated with the transportation of additional fuel to the power station site** as a result of the need to operate the power station at a higher load factor (i.e. for longer hours) than is currently the case.

No environmental fatal flaws have been identified to be associated with the proposed power station conversion project at this stage of the project. In order to assess the potential impacts on the environment associated with the construction and operation of the proposed power station conversion project, detailed specialist studies to address the

above issues must be undertaken within the EIA phase of the project. These studies must compare the impacts associated with the conversion project to the current situation and must assess the potential cumulative impacts associated with the project.

The proposed conversion would be on the site of the existing Ankerlig Power Station, and will not require any additional land take outside of the existing power station boundaries (refer to Figure 1). Therefore, **no location alternatives** have been considered within this EIA process. The following alternatives associated with the power station operation have been nominated for consideration within the EIA Phase:

» The **use of potable water** from the Witzand Water Treatment Works within the power station process.
» **Dry-cooling technology** (air-cooled condensers).
» The use of diesel and natural gas as **alternative fuel sources**.

Evaluation and Comparison of the Proposed Transmission Power Line Alternatives

Three technically feasible alternative transmission power line alignment corridors (approximately 500 m in width) were identified for investigation within the Scoping Study process (refer to Figure 2). Potential impacts associated with the proposed transmission power line are expected to occur during the construction and operational phases, and have been identified through this scoping process include:

» **Impacts on flora and fauna** as a result of the disturbance of habitats within the power line servitude and at tower footprints.
» **Impacts on avifauna** as a result of collisions with the earthwire, electrocution and disturbance of habitats within the power line servitude.
» **Impacts on heritage sites** as a result of disturbance or destruction, as well as due to visual impacts on heritage sites.
» **Visual impacts** on the surrounding area.
» **Impacts on the social environment** as a result of the creation of employment opportunities, influx of workers to the area, impacts on land use, and impacts on sense of place.

In general, the nature and extent of impacts identified is dependent on the alignment which is selected. From the specialist studies undertaken within the Scoping Phase, **Option B** was nominated as the least preferred alternative in terms of all aspects considered, as this option would result in the most significant impacts on both the social and biophysical environments. Therefore, this option is **excluded as an alternative for further investigation**.

In terms of **Option A**, the following conclusions have been drawn:

Figure 1: Aerial photograph showing Ankerlig Power Station layout and land use

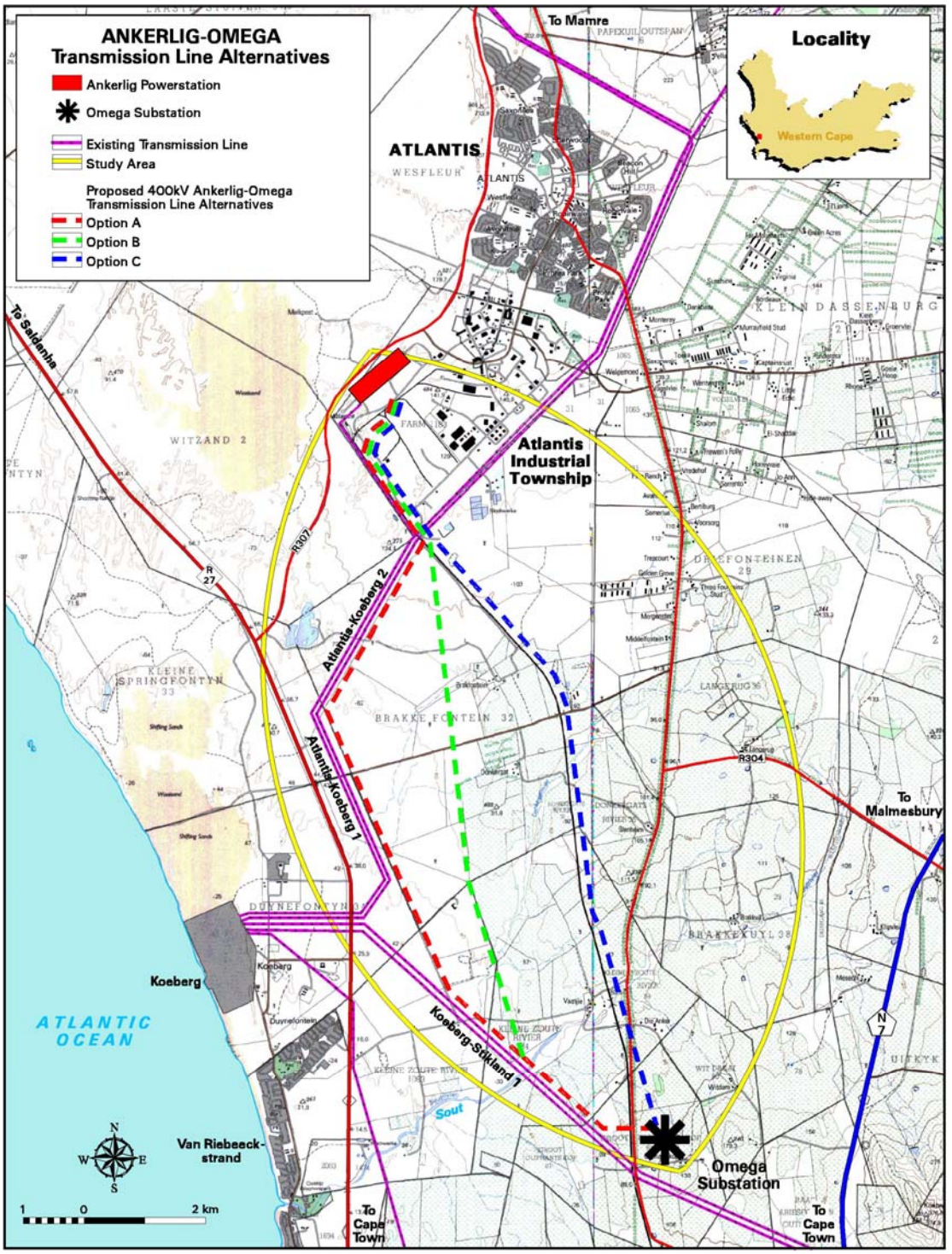

Figure 2: Transmission power line alternatives identified for investigation within the EIA process

» Follows existing power lines for the majority of the route.
» The consolidation of power line infrastructure results in a reduction in visual impacts.
» The alignment is considered preferable from an avifauna perspective as this option minimises the length of a new, isolated power line, and effectively reduces the collision risk for both the new line and the existing ones.
» Impacts on the social environment are reduced as the alignment minimises impacts on existing and planned land uses in the area.
» Option A does not lie close to any significant historical sites or places of tourism potential and no archaeological sites were recorded along the alignment during the preliminary investigations.
» This option is considered feasible. It is expected that benefits could actually outweigh the negatives if comprehensive alien clearing of the servitudes is undertaken, and the more sensitive areas are not bushcut.

In terms of **Option C**, the following conclusions have been drawn:

» Follows the Atlantis railway line for the majority of the route.
» Presents fewer botanical constraints in that it is both shorter and of lower sensitivity.
» As the most inland route of the options considered, Option C was considered to be least sensitive in terms of potential impacts on terrestrial faunal species and associated habitats.
» No archaeological sites were recorded along the alignment within the preliminary investigations.
» Considered acceptable in terms of visual & social impacts, but would potentially have an impact of higher significance on current and planned land-uses (in particular Apollo Bricks and the proposed Regional Landfill site) and sense-of-place.
» Expansion plans currently under investigation by Apollo Bricks (located to the east of the railway line) and the recently authorised Regional Landfill site (located to the west of the railway line) are likely to pose technical constraints (in terms of space requirements) to the construction and operation of the proposed power line.

From the above, it is concluded that the adoption of Option A would potentially have the lower impact on the overall environment as a result of consolidation of infrastructure of a similar nature and the minimisation of impacts on current and planned land use. **Option A** is nominated as a preferred alternative for further investigation in the EIA phase. Options B and C will not be investigated further in the EIA Phase.

During the public review period, a power line sub-alternative in the vicinity of Koeberg was recommended by the stakeholders.

This sub-alternative is proposed to follow the alignment of the existing power lines for the section of the route past Koeberg (refer to Figure 3). This sub-alternative is considered to be a technically feasible alternative and will be investigated within the EIA phase.

In order to assess the potential impacts on the environment associated with the construction and operation of the proposed power line, detailed specialist studies to address the above issues must be undertaken within the EIA phase of the project. These studies must focus on the nominated preferred alternative (i.e. option A).

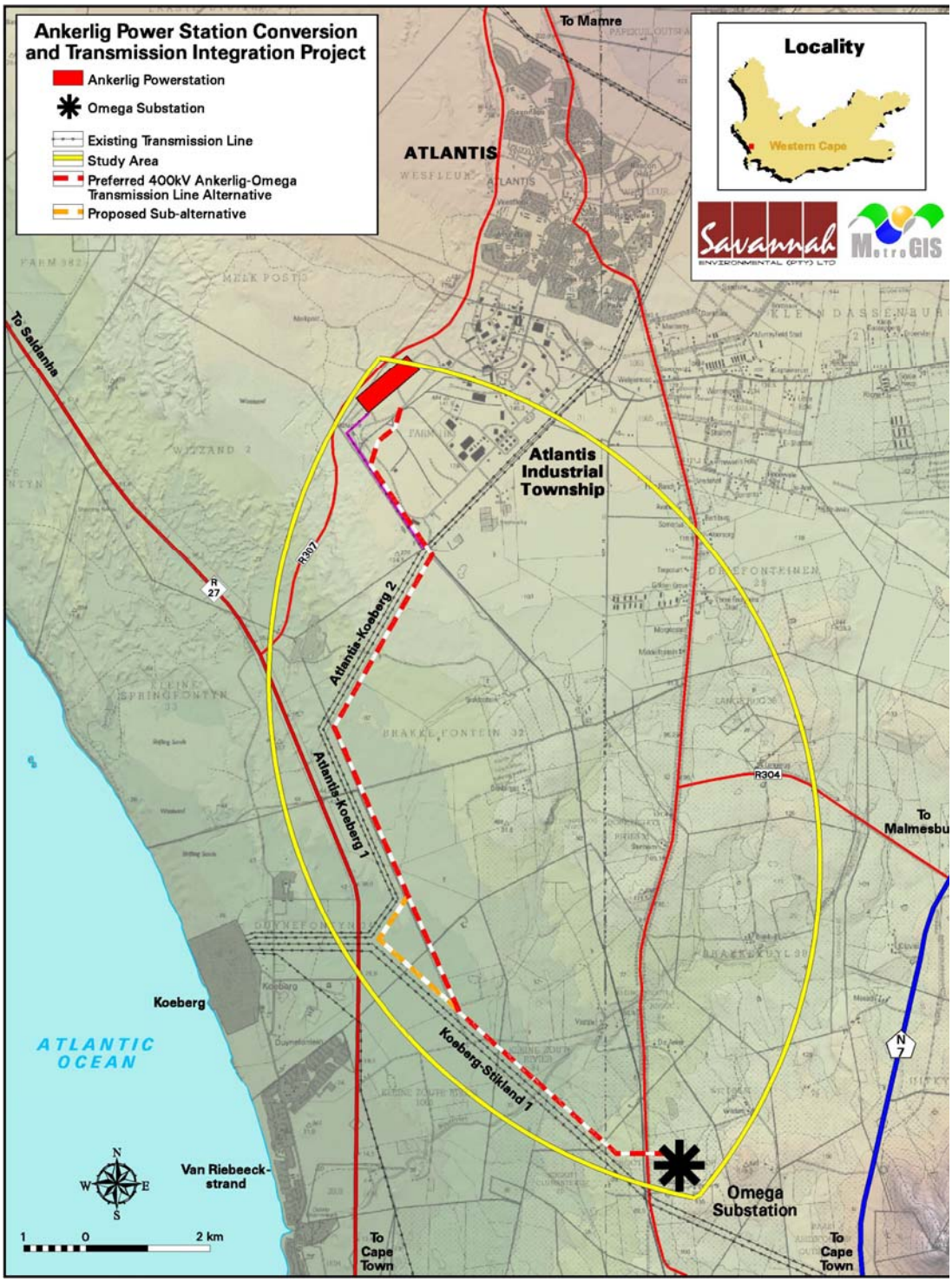

Figure 3: Nominated preferred power line alternative to be assessed within the EIA Phase, showing sub-alternative suggested for investigation during the public review period of the Draft Scoping Report

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DEFINITIONS AND TERMINOLOGY

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.

Ambient sound level: The reading on an integrating impulse sound level meter taken at a measuring point in the absence of any alleged disturbing noise at the end of a total period of at least 10 minutes after such meter was put into operation.

Condenser: Converts exhaust steam from the steam turbine back into water through a cooling process.

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

Disturbing noise: A noise level that exceeds the ambient sound level measured continuously at the same measuring point by 7 dB or more.

'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.

Dry-cooled technology: A system of air-cooled condenser fans situated in fan banks approximately between 25-30 m above ground.

Endangered species: Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating. Included here are taxa whose numbers of

individuals have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction.

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

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: An operational plan that organises and co-ordinates mitigation, rehabilitation and monitoring measures in order to guide the implementation of a proposal and its ongoing maintenance after implementation.

Heat recovery steam generator (HRSG): Component to be added to the gas turbine to recover waste heat, to drive the steam turbine cycle. In principle, a HRSG is associated with a gas turbine. One HRSG can be linked to 2 or 3 OCGT units.

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.

Mid-merit capacity: Electricity capacity during the daytime from about 6 am to about 10 pm on weekdays

Peaking generation capacity: Peaking power refers to power generation technology designed to generate electricity during periods of high electricity demand, generally in the weekday mornings from 07:00 to 09:00 and weekday evenings from 18:00 to 20:00.

Rare species: Taxa with small world populations that are not at present Endangered or Vulnerable, but are at risk as some unexpected threat could easily cause a critical decline. These taxa are usually localised within restricted geographical areas or habitats or are thinly scattered over a more extensive range. This category was termed Critically Rare by Hall and Veldhuis (1985) to distinguish it from the more generally used word "rare".

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

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

ABBREVIATIONS AND ACRONYMS

BID	Background Information Document
CBOs	Community Based Organisations
CCGT	Combined Cycle Gas Turbine
CO_2	Carbon dioxide
DEA&DP	Western Cape Department of Environmental Affairs and Development Planning
DEAT	National Department of Environmental Affairs and Tourism
DME	Department of Minerals and Energy
DOT	Department of Transport
DWAF	Department of Water Affairs and Forestry
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
GIS	Geographical Information Systems
GG	Government Gazette
GN	Government Notice
HWC	Heritage Western Cape
I&AP	Interested and Affected Party
IEP	Integrated Energy Planning
km^2	Square kilometres
kV	Kilovolt
LUPO	Rezoning and Subdivision in terms of Land Use Planning Ordinance, Ordinance 15 of 1985
m^2	Square meters
MW	Mega Watt
NEMA	National Environmental Management Act (Act No 107 of 1998)
NERSA	National Energy Regulator of South Africa
NHRA	National Heritage Resources Act (Act No 25 of 1999)
NGOs	Non-Governmental Organisations
NIRP	National Integrated Resource Planning
NWA	National Water Act (Act No 36 of 1998)
OCGT	Open Cycle Gas Turbine
PGWC	Provincial Government of the Western Cape
SAHRA	South African Heritage Resources Agency
SIA	Social Impact Assessment

INTRODUCTION CHAPTER 1

Eskom Holdings Limited (Eskom) is investigating the conversion of the nine Open Cycle Gas Turbine (OCGT) units at the existing Ankerlig Power Station (located in Atlantis Industria) plant to a Combined Cycle Gas Turbine (CCGT). This would increase the generating capacity of this existing power station by a maximum capacity of 720 MW. The proposed conversion involves the addition of steam turbines to the existing gas turbine plant, and would be established on the same site as the existing Ankerlig Power Station.

Eskom is also proposing the construction of a 400kV transmission power line between the Ankerlig Power Station and the already authorised Omega Substation (to be located on the Farm Groot Oliphantskop 81) to integrate the additional power generated at Ankerlig Power Station into the national electricity grid.

The Ankerlig Power Station conversion and associated transmission integration project can be seen as a third phase of the original Atlantis OCGT power station project. The construction of the initial OCGT units (i.e. the four units now in operation) was the first phase of the project. The second phase of the project (currently under construction) involves the expansion (capacity increase) of the power station by adding another five OCGT units, four fuel tanks and a switchyard to the power station.

The nature and extent of the power station conversion and transmission integration project, as well as potential environmental impacts associated with the construction of a facility of this nature is explored in more detail in this Scoping Report.

1.1. The Need for the Proposed Project

Eskom contributes to its vision of “Together building the powerbase for sustainable growth and development” through its core business focus on electricity generation, transportation, trading and retail. It entrenches the values of excellence, innovation, customer satisfaction and integrity across all business operations.

Achieving the vision requires in-depth planning and energetic implementation in a complex environment characterised by higher economic growth, greater demand for electricity and the heightened need for significant infrastructure expansion with attendant competition for scarce materials, funding, skills and supplier inputs. Challenges are compounded by the rising cost of primary energy and new

components, regulatory pressure, restructuring of the electricity distribution industry, expectations of better environmental performance and the growing involvement of stakeholder groups.

Considering the Government's Accelerated and Shared Growth Initiative for South Africa (ASGI-SA) targets and load growth currently being experienced, South Africa will require additional power in the next five years. To supply this additional demand in the medium term, a variety of options such as demand side management, cogeneration non-Eskom generation and gas-fired plants (open cycle and combined cycle), continue to be investigated by Eskom in addition to conventional long term supply options such as electricity generation with coal, nuclear fuels.

As part of its plans for increased electricity supply options, Eskom is proposing the conversion of the existing OCGT units installed and being installed at the existing Ankerlig Power Station (near Atlantis) and the Gourikwa Power Station (near Mossel Bay) in the Western Cape to **Combined Cycle Gas Turbine** (CCGT) units. Due to the medium-term forecast in the demand for electricity (until approximately 2014) and constraints associated with meeting this projected demand, the conversion of these OCGT units to CCGT units is one of the few options available to Eskom to manage the projected demand in the medium-term.

The conversion of the nine units at the Ankerlig Power Station and the five units at the Gourikwa Power Station would increase the generating capacity of the OCGT units within the Western Cape by a maximum of approximately 1120 MW (i.e. ~720 MW at Ankerlig and ~400 MW at Gourikwa). This would be achieved by increasing the efficiency of the gas turbine plant (i.e. more power generated and sent out, for the same amount of fuel used at the same operating regime). Overall thermal efficiency is therefore increased from approximately 34% for the current OCGTs to approximately 50% to 55% for the proposed CCGT plant, depending on the operating regime of the plant.

This Scoping Study considers the conversion of the OCGT units at the Ankerlig Power Station to CCGT units, and considers a **maximum capacity increase of 720 MW**. Environmental studies for the conversion of the OCGT units at the Gourikwa Power Station will be the subject of a separate EIA process, which is planned to commence shortly. Eskom will submit a separate application for the maximum capacity increase at this power station. However, the decision around the total number of OCGT units to be converted to CCGT units, and the final split of generation capacity between these two power stations is still to be determined by Eskom.

Electricity cannot be readily or inexpensively stored and must be used as it is generated. It is, therefore, required that electricity must be efficiently

transmitted from the point of generation to the end user. It is vital that transmission capacity keeps up with both electricity generation capacity and electricity demand. Therefore, in order to integrate the additional power generated at the Ankerlig Power Station into the national electricity grid, the construction of a new **400kV transmission power line** between the Ankerlig Power Station and the Omega Substation will be required.

1.2. Background to the Project

Environmental Impact Assessment (EIA) processes have previously been undertaken by Eskom for the existing OCGT units at Atlantis (with the existing four units (with a nominal capacity of 600 MW) approved in December 2005 and an additional five units (with a nominal capacity of 750 MW) approved in July 2007). The construction and commissioning of the initial four OCGT units is complete, and these units have been operational since mid-2007. Construction of the additional five OCGT units is currently underway and is expected to be complete end-2008/beginning 2009. The electricity generation capacity of the Ankerlig Power Station will assist Eskom in meeting the peaking electricity generation demands[1] in the medium-term (i.e. up to 2014).

Subsequently, using the strategic electricity planning in place (refer to Chapter 2) and taking into account the continued growth in electricity demand, Eskom has determined that there is a need for **additional** power generation capacity in the **medium-term**. In considering the most suitable options to meet the increased electricity demand in the medium term, Eskom has concluded that it would be feasible to convert the existing Ankerlig OCGT units to CCGT units, thereby generating additional capacity for the same amount of fuel (under a similar operating regime) considering the load factors at which the units may have to operate.

1.3. Project Overview

The existing Ankerlig OCGT Power Station is located on the Remainder of Farm No 1395 in the Atlantis Industrial Township (refer to Figure 1.1), which is located ~40 km from the Cape Town city centre.

[1] OCGT units are best suited for peaking generation capacity (i.e. for peak periods in the morning and evenings).

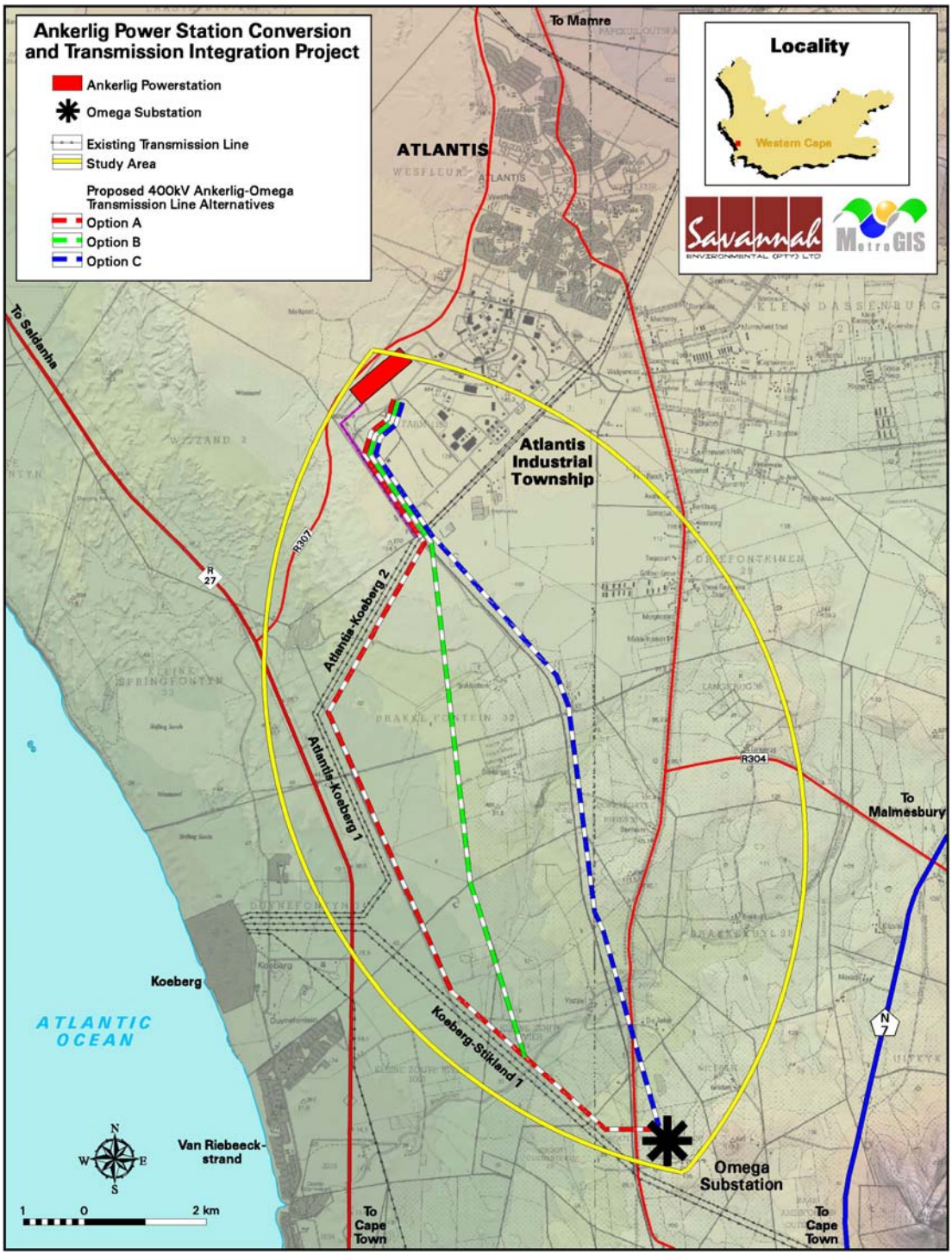


Figure 1.1: Locality map showing the location of the existing Ankerlig Power Station, the study area and the proposed transmission power line corridor alternatives between Ankerlig and Omega Substation

1.3.1. Power Station Conversion

The Ankerlig OCGT Power Station will consist 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 approximately 150 MW, resulting in a total nominal capacity of approximately 1 350 MW for the power station.

Each OCGT unit consists of one gas turbine driving an electric generator. The concept of converting the OCGT units to CCGT units is to utilise the **heat energy** from the exhaust of the gas turbine to create steam in the Heat Recovery Steam Generator (HRSG), to drive a steam turbine, instead of this heat energy being exhausted and lost to the to the atmosphere (as is the current scenario). Conversion of the units to CCGT is therefore based on increased cycle efficiency.

Simply stated, this can be achieved through the following (and is illustrated in Figure 1.2):

» When the hot gas exits the gas turbine as exhaust gas, it has a temperature of up to 600°C. This heat energy is transferred to water in the heat recovery steam generator, instead of being exhausted to the atmosphere.
» The heat is used to generate steam (water vapour), which powers the steam turbine to produce mechanical energy.
» The resulting mechanical energy is transferred to a generator, where it is converted into electricity.

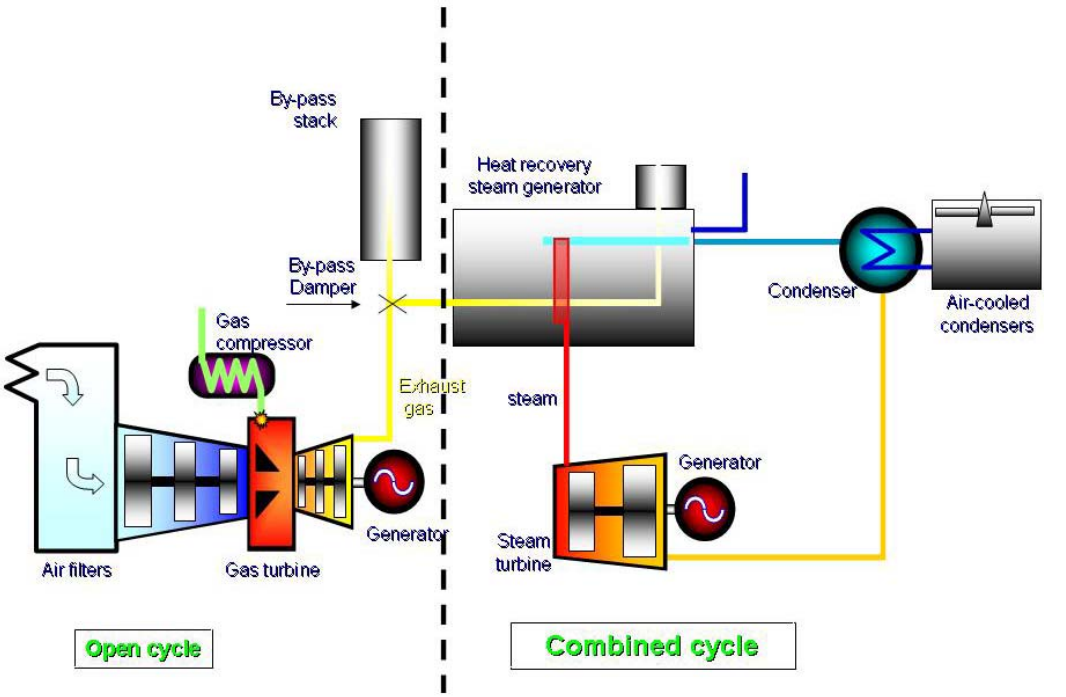


Figure 1.2: Simplified schematic CCGT diagram

Each OCGT unit converted will produce approximately 80 MW additional capacity Therefore, an additional 9 x 80 MW increase in capacity (approximately 720 MW total) is foreseen from the OCGT to CCGT conversion. The total nominal capacity of the Ankerlig Power Station will therefore increase to approximately 2 070 MW.

The proposed conversion will be on the site of the existing Ankerlig Power Station, and will not require any additional land take outside of the existing power station boundaries (refer to Figure 1.3).

The primary components of the conversion project include the following:

» A **heat recovery steam generator** (HRSG) will be added to the gas turbine to recover waste heat, to drive the steam turbine cycle. In principle, a HRSG is associated with a gas turbine. One HRSG can be linked to 2 or 3 OCGT units.
» A **condenser** which converts exhaust steam from the steam turbine back into water through a cooling process.
» Depending on the configuration, a **bypass stack** for the CCGT, anticipated to be approximately 60 m in height will be associated with each HRSG.
» **Water treatment plant** (for treatment of potable water and production of demineralised water (for steam generation). A **waste disposal system** for the effluent from this water treatment system will be required.
» **Dry-cooled technology** consisting of a system of air-cooled condenser fans situated in fan banks approximately between 25-30 m above ground.
» **Additional fuel storage facilities** and associated off-loading and other related infrastructure to cater for the increased fuel requirements associated with the higher load factor (i.e. longer operating hours or a mid-merit operating regime[2]).
» An **elevated water tank**, approximately 20m high, with a holding volume of approximately 2.5 million litres (i.e. water storage for approximately 5 days of operation).

It is important to note that the plant can use liquid fuel or natural gas as fuel. It is envisaged that the CCGT units would initially be diesel-fired, until such time that natural gas becomes available, if it becomes available.

[2] Mid-merit capacity is during the daytime from about 6 am to about 10 pm on weekdays.

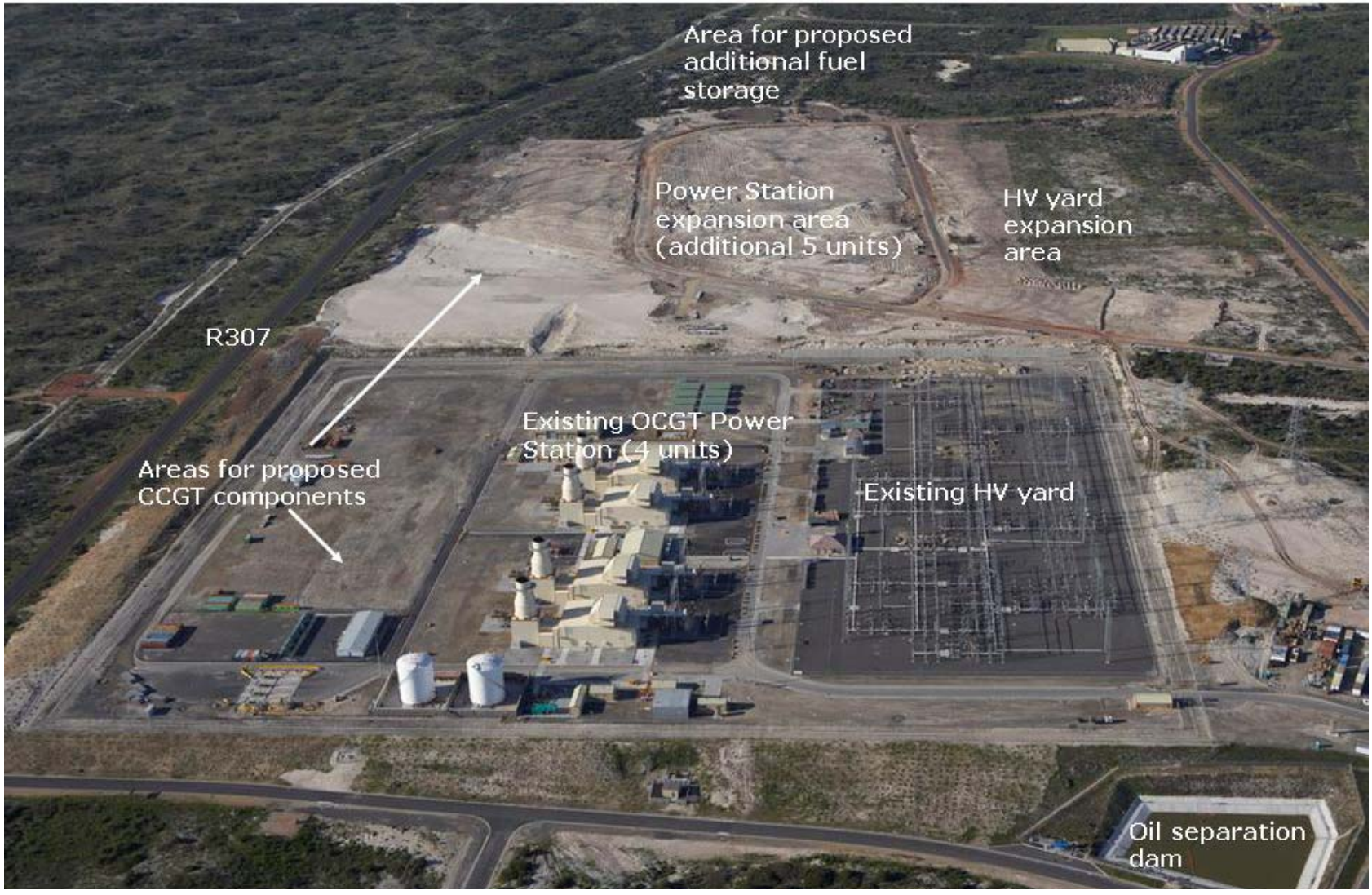


Figure 1.3: Aerial photograph of the Ankerlig Power Station site showing the existing power station infrastructure the power station expansion site, as well as the areas for the placement of infrastructure associated with the proposed power station conversion

1.3.2. Integration of the CCGT Power Station into the National Grid

A 400kV transmission power line is required to be constructed between the Ankerlig Power Station and the Omega Substation (authorised but not yet constructed, and to be located on the Farm Groot Oliphantskop 81) to integrate the additional power generated at this power station to the national electricity grid. The existing substation (high voltage (HV) yard) at the Ankerlig Power Station will be utilised, and no additional infrastructure or expansion of this HV yard is required to accommodate the new transmission power line.

Technically feasible alternative transmission power line alignment corridors (approximately 500 m in width) have been identified for investigation within the EIA process (refer to Figure 1.1). Through the Scoping study process, a preferred alternative power line corridor has been nominated for environmental authorisation (by the environmental authorities), provided no environmental fatal flaws are identified to be associated with the proposed project.

Transmission power lines are constructed and operated within a 55 m wide servitude that is established along the entire length of the line. Within this servitude, Eskom would have certain rights and controls that support the safe, effective operation and maintenance of the line. The process of achieving options to acquire servitudes is referred to as the Servitude Negotiation Process with each affected landowner. The negotiation process is undertaken directly by Eskom and is independent of and follows on from the EIA process.

1.4. Requirement for an Environmental Impact Assessment Process

The proposed power station and transmission power line integration project is subject to the requirements of the Environmental Impact Assessment Regulations (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 numbers **12/12/20/1014** (**power station conversion**) and **12/12/20/1037** (**transmission power line**)). Through the

decision-making process, DEAT will be supported by the Western Cape Department of Environmental Affairs and Development Planning (DEA&DP).

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) relevant to the **power station conversion**:

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

No & date of relevant notice	Activity No (in terms of relevant Regulation / notice)	Description of listed activity
Government Notice R387 (21 April 2006)	1(e)	Any process or activity which requires a permit or licence in terms of legislation governing the generation or release of emissions, pollution, effluent or waste and which is not identified in Government Notice No. R 386 of 2006
Government Notice R387 (21 April 2006)	1(j)	The bulk transportation of dangerous goods using pipelines, funiculars or conveyors with a throughput capacity of 50 tons or 50 cubic metres or more per day
Government Notice R387 (21 April 2006)	2	Any development activity, including associated structures and infrastructure, where the total area of the developed area is, or is intended to be, 20 hectares or more
Government Notice R386 (21 April 2006)	1(k)	The construction of facilities or infrastructure, including associated structures or infrastructure, for the bulk transportation of sewage and water, including storm water, in pipelines with - » an internal diameter of 0,36 metres or more; or » a peak throughput of 120 litres per second or more
Government Notice R386 (21 April 2006)	1(n)	The construction of facilities or infrastructure, including associated structures or infrastructure, for the off-stream storage of water, including dams and reservoirs, with a capacity of 50 000 cubic metres or more, unless such storage falls within the ambit of the activity listed in item 6 of Government Notice No. R. 387 of 2006
Government Notice R386 (21 April 2006)	1(s)	The treatment of effluent, wastewater or sewage with an annual throughput capacity of more than 2000 cubic meters but less than 15 000 cubic meters.
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

No & date of relevant notice	Activity No (in terms of relevant Regulation / notice)	Description of listed activity
Government Notice R386 (21 April 2006)	15	The construction of a road that is wider than 4 m or that has a reserve wider than 6 m, excluding roads that fall within the ambit of another listed activity or which are access roads of less than 30 m long.

The following activities listed in terms of GN R386 and R387 (GG No 28753 of 21 April 2006) relevant to the **transmission power line integration**:

No & date of relevant notice	Activity No (in terms of relevant Regulation / notice)	Description of listed activity
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)	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)	15	The construction of a road that is wider than 4 metres or that has a reserve wider than 6 metres, excluding roads that fall within the ambit of another listed activity or which are access roads of less than 30 metres long.

This report documents the scoping evaluation of the potential environmental impacts of the proposed construction and operation phases of the proposed power station conversion and transmission integration project. This scoping 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 the National Environmental Management Act (NEMA; Act No 107 of 1998).

1.5. Objectives of the Scoping Phase

The Scoping Phase of the EIA process refers to the process of identifying potential issues associated with the proposed project, and defining the extent of studies required within the EIA Phase. This is achieved through an evaluation of the proposed project, involving the project proponent, specialists with experience in EIAs for similar projects, and a public consultation process with key stakeholders that includes both government authorities and interested and affected parties (I&APs).

In accordance with the EIA Regulations, the main purpose of the Scoping Phase is to focus the environmental assessment in order to ensure that only potentially significant issues, and reasonable and feasible alternatives are examined in the EIA Phase. The Draft Scoping Report made available for public review from 21 January 2008 to 21 February 2008 provided stakeholders with an opportunity to verify that the issues they raised through the process had been captured and adequately considered, and provided a further opportunity for additional key issues for consideration to be raised. This Final Scoping Report incorporates all issues and responses raised during the Scoping Study as well as during the public review of the Draft Scoping Report and is submitted to DEAT for review and acceptance.

The Scoping Report consists of nine sections:

Chapter 1 provides background to the proposed power station conversion and transmission integration project and the environmental impact assessment process.
Chapter 2 provides the strategic context for energy planning in South Africa.
Chapter 3 describes the components of the proposed project (project scope).
Chapter 4 outlines the process which was followed during the Scoping Phase of the EIA process, including the consultation program that was undertaken and input received from interested parties.
Chapter 5 describes the existing biophysical and socio-economic environment.
Chapter 6 presents the evaluation of environmental impacts associated with the power station conversion.
Chapter 7 presents the evaluation of environmental impacts associated with the proposed transmission power line.
Chapter 8 presents the conclusions of the scoping evaluation.
Chapter 9 describes the Plan of Study for EIA.
Chapter 10 provides a list of references and information sources used in undertaking the studies for this Scoping Report.

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

Savannah Environmental was contracted by Eskom Holdings Limited as an independent environmental assessment practitioner to undertake an Environmental Impact Assessment (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 Holdings Limited. 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 Scoping 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 Holdings Limited 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 4. The curricula vitae for the EIA specialist consultants are also included in Appendix A.

Eskom contributes to its vision of "Together building the powerbase for sustainable growth and development" through its core business focus on electricity generation, transportation, trading and retail. It entrenches the values of excellence, innovation, customer satisfaction and integrity across all business operations.

Achieving the vision requires in-depth planning and energetic implementation in a complex environment characterised by higher economic growth, greater demand for electricity and the heightened need for significant infrastructure expansion with attendant competition for scarce materials, funding, skills and supplier inputs. Challenges are compounded by the rising cost of primary energy and new components, regulatory pressure, restructuring of the electricity distribution industry, expectations of better environmental performance and the growing involvement of stakeholder groups.

The following four strategic objectives are key to achieving this vision:

» ***Sustaining quality and continuity of supply:***
This requires effective management of total system capacity and reliability planning, focusing on primary energy availability, maintenance, refurbishment and energy efficiency. Stretch targets need to be set while maintaining rigorous occupational health and safety standards.

» ***Capacity expansion:***
Successful delivery on the capacity expansion programme is central to Eskom's vision and entails thorough environmental impact assessments, site selection and optimisation, procurement efficiency, project management and commitment to health and safety in the construction environment while rigorously applying Eskom's climate change and air quality strategies. The challenge is to build new plant, on time and on budget, while running existing plant at optimal levels.

» ***Funding and resourcing:***
The build programme imposes significant funding and resourcing requirements. Appropriate skills and information management systems are also vital to ensure a sustainable business and delivery on the build programme. Other key factors include multi-year pricing determination, revenue management, efficiency initiatives and Eskom's skills acquisition and retention strategies.

» ***Leveraging business operations for developmental benefits:***
Sustainability shapes the way Eskom conducts business and provides the context for its developmental initiatives.

The magnitude of Eskom's current business procurement spend and the planned capacity expansion programme create opportunities for maximising the organisation's contribution to government's Accelerated and Shared Growth Initiative for South Africa (ASGI-SA). The mechanisms include the fostering of small and medium enterprises, black women-owned businesses and skills development, accelerated electrification and Eskom's corporate social investment spend. Local content will be a core requirement when major contracts are awarded.

Over the last decade, South Africa has experienced a steady growth in the demand for electricity on the back of healthy economic growth. The continued growth in the economy has exhausted Eskom's surplus electricity generation capacity and reduced our electricity reserves progressively. It is expected that the reserve margin will continue on a downward trend for the next seven years until new base-load power plant is built (2014). In spite of new capacity coming on line, which includes bringing back moth-balled power stations and building Open Cycle Gas Turbines, the electricity demand within the country is still higher than available capacity. Eskom is stepping up the implementation of this capacity expansion programme and will invest about R150 billion over the next five years in the upgrading of South Africa's power supply infrastructure. The biggest percentage of the expenditure will go towards improving generation capacity through, among others, the construction of new power stations.

The decision to expand Eskom's electricity generation capacity is based on **national policy** and informed by on-going strategic planning undertaken by the national Department of Minerals and Energy (DME), the National Energy Regulator of South Africa (NERSA) and Eskom. Strategic decisions regarding the electricity generation options to meet energy requirements within the country are made through this strategic planning process. The acceptability of options investigated at a project-specific level from a technical, economic and environmental perspective.

The hierarchy of policy and planning documentation is illustrated in Figure 2.1.

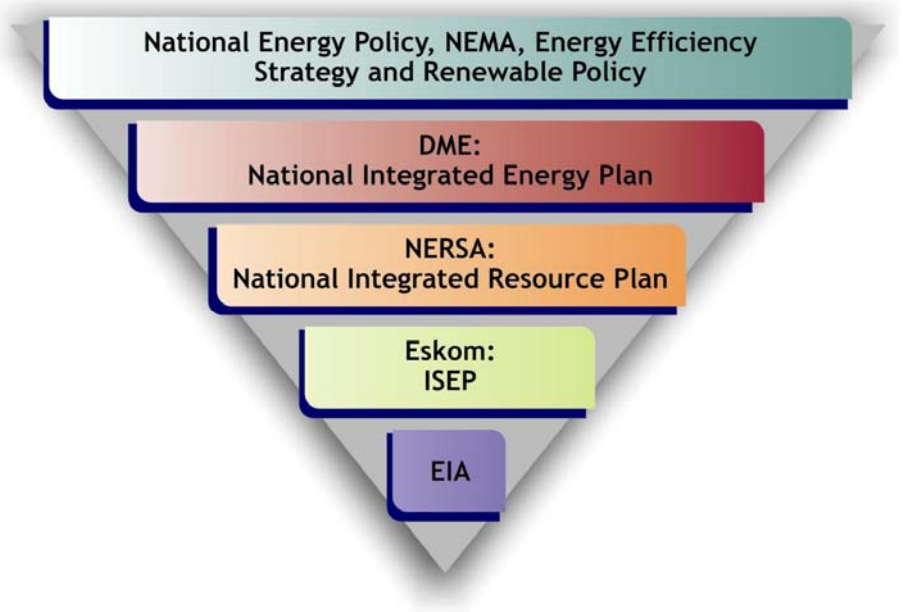


Figure 2.1: Hierarchy of electricity policy and planning documents

2.1. White Paper on the Energy Policy of the Republic of South Africa, 1998

Development within the energy sector in South Africa is governed by the White Paper on a National Energy Policy (the National Energy Policy), published by DME in 1998. This White Paper identifies five key objectives for energy supply within South Africa, that is:

» Increasing access to affordable energy services
» Improving energy sector governance
» Stimulating economic development
» Managing energy-related environmental impacts
» Securing supply through diversity.

Furthermore, the National Energy Policy identifies the need to undertake an Integrated Energy Planning (IEP) process and the adoption of a National Integrated Resource Planning (NIRP) approach. Through these processes, the most likely future electricity demand based on long-term southern African economic scenarios can be forecasted, and provide the framework for South Africa (and Eskom) to investigate a whole range of supply and demand side options.

2.2. Integrated Energy Plan (IEP) – 2003

In response to the requirements of the National Energy Policy, the DME commissioned the Integrated Energy Plan (IEP) to provide a framework in which specific energy policies, development decisions and energy supply trade-offs can be made on a project-by-project basis. The framework is intended to create a

balance between the energy demand and resource availability to provide low-cost electricity for social and economic development, while taking into account health, safety and environmental parameters.

The IEP projected that the additional demand in electricity would necessitate an increase in electricity generation capacity in South Africa by 2007. Furthermore, the IEP recognises:

- That South Africa is likely to be reliant on coal for at least the next 20 years as the predominant source of energy.
- That new electricity generation will remain predominantly coal-based, but with the potential for hydro, natural gas, and nuclear capacity.
- The need to diversify energy supply through increased use of natural gas and new and renewable energies.
- Continuing investigations into nuclear options as a future new energy source.
- The promotion of the use of energy efficiency management and technologies.
- The need to ensure environmental considerations in energy supply, transformation and end use.
- The promotion of universal access to clean and affordable energy, with the emphasis on household energy supply being co-ordinated with provincial and local integrated development programmes.
- The promotion of the use of energy efficiency management and technologies.
- The need to maximise load factors on electricity generation plants to lower levelised lifecycle costs.
- The need to lessen reliance on imported liquid fuels by exploring and developing oil and gas deposits.
- The need to increase existing oil refineries capacity where appropriate rather than greenfields development.
- The continuation of existing synfuel plants and supplement with natural gas as feedstock.
- The need to introduce policy, legislation and regulation for the promotion of renewable energy and energy efficiency measures and mandatory provision of energy data.
- The need to undertake integrated energy planning on an on-going basis

2.3. National Integrated Resource Plan (NIRP), 2003/2004

In response to the National Energy Policy's objective relating to affordable energy services, NERSA commissioned a National Integrated Resource Plan (NIRP) in order to provide a long-term, cost-effective resource plan for meeting electricity demand, which is consistent with reliable electricity supply and environmental, social and economic policies. The planning horizon for the study was from 2003 to 2022.

The objective of the NIRP is to determine the least-cost supply options for the country, provide information on the opportunities for investment into new power generating projects, and evaluate the security of supply. The NIRP also provides an assessment of the system reliability and serves as a benchmarking tool for market performance. It also examines specific public policies, including those on security of electricity supply and risks associated with the current system.

The national electricity demand forecast took a number of factors into account. These include:

» A 2,8% average annual economic growth.
» The development and expansion of a number of large energy-intensive industrial projects.
» Electrification needs.
» A reduction in electricity-intensive industries over the 20-year planning horizon.
» A reduction in the number of electricity consumers – NIRP anticipates people switching to the direct use of natural gas.
» The supply of electricity to large mining and industrial projects in Namibia and Mozambique.
» Typical demand profiles.

Various demand side management and supply-side options are considered in the NIRP process, prior to identifying the least cost supply options for South Africa. The outcome of the process confirmed that coal-fired options are still required over the next 20 years, and that additional base load plants will be required from 2010.

The first NIRP (NIRP1) was carried out during 2001. The second NIRP was carried out under the auspices of the NER in the period 2003-2004. NIRP2 has been drastically improved, compared to its predecessor, NIRP1. It provides moderate and high electricity and demand forecasts, a complete database of the cost and performance of the generation plant considered in the optimisation, detailed output results, methodology applied in the planning process and risk and sensitivity analyses. To a large extent the NIRP report content resembles IRPs recently developed by international utilities and planning panels.

Other important changes from NIRP1 is the inclusion of risk and sensitivity analyses and scenarios to address risk factors and uncertainties that are associated with the long-term demand forecast; performance of existing generation plants; sustainability and delivery of demand-side management (DSM) options, including Interruptible load supplies; and changes in the electricity demand load shape. Further, NIRP2 takes into account transmission integration

costs and credits for regional location of new capacity that were not considered in the previous national resource plan.

2.4. Integrated Strategic Electricity Planning (ISEP) in Eskom

Eskom uses a modelling tool called Integrated Strategic Electricity Planning (ISEP) to plan its future capacity strategy. By analysing usage patterns and growth trends in the economy, and matching these with the performance features of various generation technologies and demand side management options, ISEP identifies the timing, quantity and type (base load or peaking) of new capacity options required in the long-term. These options include the Return-to-Service of the three mothballed coal-fired Simunye Power Stations (i.e. Camden, Komati and Grootvlei), conventional pulverised fuel power plants (i.e. coal-based power), pumped storage schemes, gas-fired power plants, nuclear plants, greenfield fluidised bed combustion technologies, renewable energy technologies (mainly wind and solar projects), and import options within the Southern African Power Pool. As the older Eskom power plants reach the end of their design life from approximately 2025 onwards, the use of all available technologies will need to be exploited to replace these in order to supply the country's growing electricity demand.

The ISEP process identifies the timing, quantity and type (e.g. base load or peaking) of new electricity generating capacity required over the next 20 years. The planning scenarios are based on an average 4% growth in demand for electricity over the 20 year period. This translates into a 6% growth in GDP. The most recently approved ISEP plan (ISEP11) identified the need for increased *peaking* electricity generating by *2007* and additional *baseload* capacity by approximately *2010*. An increase in peaking supply has since been achieved through the commissioning of new plant, such as the OCGT facilities at Atlantis and Mossel Bay in the Western Cape. Figure 2.2 illustrates Eskom's "project funnel", which shows the range of supply options being considered by Eskom to meet the increasing demand for electricity in the country. There are many projects at various stages in the project funnel including research projects, transmission lines and generating options in South Africa and Southern Africa.

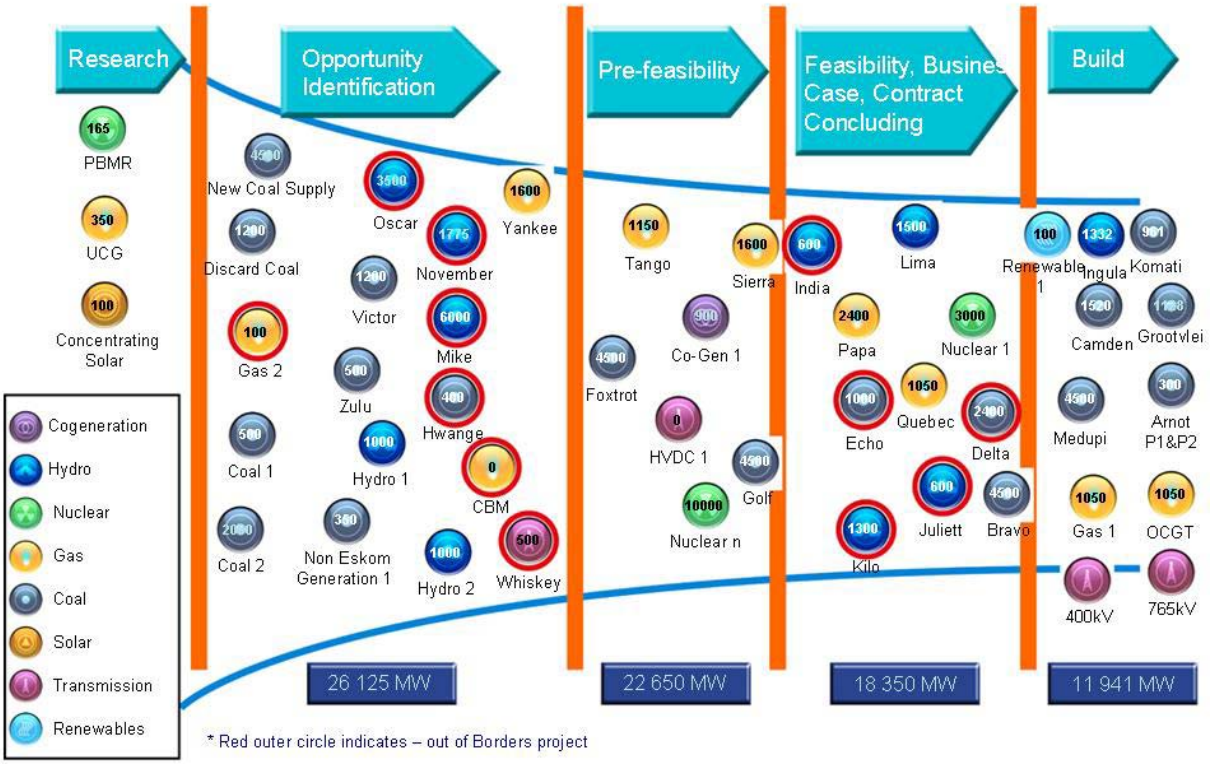


Figure 2.2: Eskom Project Funnel illustrating the range of supply options being considered by Eskom to meet the increasing demand for electricity in the country

As is evident in Figure 2.2, the proposed Ankerlig Power Station conversion and transmission integration project is currently within the pre-feasibility phase (indicated by the orange circle entitled 'Tango'), i.e. this project is currently being investigated in terms of its economic, technical and environmental feasibility.

Eskom is currently conducting various energy-related projects in the Western Cape. These are mostly power generation or transmission projects, in various stages of project development. The following list contains some of the projects currently underway:

» Ankerlig Expansion (Gas 1) – under construction, to be completed end-2008.
» Gourikwa Expansion (Gas 1) – under construction, to be completed end-2008.
» Omega Substation – already-authorised on the Farm Groot Olifantskop, construction to commence in September 2009.
» Gourikwa Power Station conversion project – EIA process recently commenced.
» Fuel transportation study between Milnerton and Ankerlig Power Station via a liquid fuel pipeline, as well as transport of fuel by rail – Scoping process now underway.

- Relocation of the Acacia gas turbines from the existing site in Goodwood to the Ankerlig Power Station site in Atlantis – Scoping process to begin shortly.
- Palmiet-Stikland 400 kV transmission line – Commissioned in August 2007.
- Nuclear 1 – Environmental Impact Assessment process has commenced. Draft Scoping Report has been made available for public comment.
- Nuclear 1 transmission power lines – EIA process to commence shortly.
- Wind Energy Facility in the Vredendal area - Environmental Impact Assessment process has commenced. Final EIA Report has been submitted to DEAT for review and decision-making.
- Pebble-bed Modular Reactor - Awaiting approval of Final Scoping Report and Plan of Study for EIA from DEAT.

2.5. Draft Western Cape Integrated Energy Strategy

The recent energy crisis in the Western Cape has highlighted the need to develop a plan for sustainable, secure energy provision in the Western Cape. Although various national efforts are underway to increase energy provision to the Western Cape, the Provincial Government believes that additional efforts need to be made to address the other energy challenges facing the Province, including the challenges of reducing the Province's carbon footprint and eradicating energy poverty.

The Western Cape currently relies heavily on coal-produced electricity and on petrochemicals for its energy supply. The strategy recognises that, in order to ensure that energy can be accessed from various sources in emergency situations, it is necessary to explore alternative sources of energy. The strategy lists the potential opportunities for increasing power supply to the Province. In this regard, the strategy states that the potential for gas-fired power generation is high, provided that sufficient resources of natural gas are discovered. However, supplies are currently not confirmed. Natural gas is a cleaner fossil fuel-based option than coal and can provide base load capacity.

The Strategy details various goals to which the Provincial Government of the Western Cape (PGWC) is committed and outlines a programme of action for implementation of the strategy framework (a copy of this Strategy can be obtained at http://www.capegateway.gov.za/eng/pubs/public_info/D/152704).

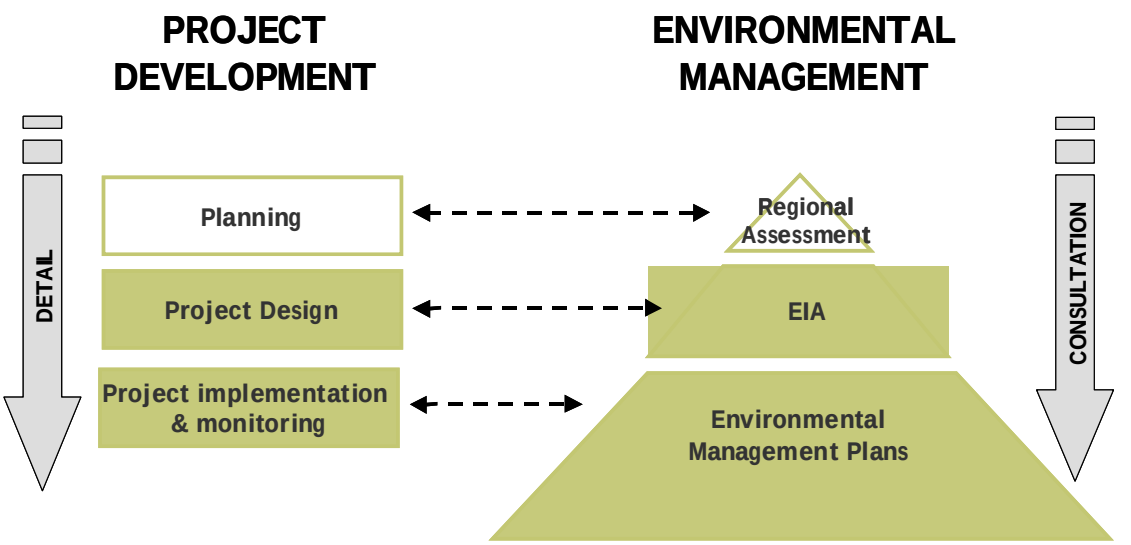
2.6. Project Planning and the site-specific Environmental Impact Assessment

Eskom Generation's planning process is based on anticipated electricity demand, rather than immediate load requirements in order to timeously supply the anticipated increased demand in the country. This is due to the long lead-time process of acquiring the necessary permissions to construct such infrastructure from DEAT and the National Energy Regulator of South Africa (NERSA), and

negotiations with landowners, and power generation infrastructure purchase, delivery and ultimately construction.

In terms of the EIA Regulations under NEMA, a Scoping and EIA report (including a draft Environmental Management Plan (EMP)) are required to be compiled for this proposed project. The EIA is considered as an effective planning and decision-making tool in the planning process of a new power generation facility. It allows the environmental consequences resulting from a technical facility during its establishment and its operation to be identified and appropriately managed through project design and implementation. The level of detail at a site-specific level is refined through the process, and allows for resolution of potential issue(s) through dialogue with affected parties.

The relationship between project development and the environmental assessment and management process is depicted in the figure below.



DESCRIPTION OF THE PROPOSED ANKERLIG POWER STATION & TRANSMISSION INTEGRATION PROJECT CHAPTER 3

This chapter provides details regarding the scope of the proposed Ankerlig Power Station and Transmission Integration Project, including all required elements of the project and necessary steps for the project to proceed. The scope of project includes construction and operation activities.

3.1. Power Station Conversion

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. Each OCGT unit consists of one gas turbine driving an electric generator. The concept of converting the OCGT units to CCGT units is to utilise the **heat energy** from the exhaust of the gas turbine to drive a steam turbine, instead of this heat energy being exhausted and lost to the to the atmosphere (as is the current scenario).

Simply stated, this can be achieved through the following:

» When the hot gas exits the gas turbine as exhaust gas, it has a temperature of up to 600°C. This heat energy is transferred to water in the heat recovery steam generator, instead of being exhausted to the atmosphere.
» The heat is used to generate steam (water vapour), which powers the steam turbine to produce mechanical energy.
» The resulting mechanical energy is transferred to a generator, where it is converted into electricity (i.e. electrical energy).
» A condenser converts exhaust steam from the steam turbine back into saturated water through a cooling process.

Conversion of the units to CCGT would be undertaken to increase cycle thermal efficiency. It is estimated that each converted unit would produce approximately 80 MW additional capacity, i.e. approximately 50% more than a standard OCGT unit. Therefore, an additional 9 x 80 MW (720 MW in total) increase in capacity is foreseen from the OCGT to CCGT conversion. The **total nominal capacity** of the Ankerlig Power Station would, therefore, be **2 070 MW**. The proposed conversion would be on the site of the existing Ankerlig Power Station, and would not require any additional land take outside of the existing power station boundaries. Therefore, no location alternatives have been considered within this EIA process.

The primary components of the conversion project include the following:

» A **heat recovery steam generator** (HRSG) would be added to the gas turbine to recover waste heat, to drive the steam turbine cycle. In principle, a HRSG is associated with a gas turbine. One HRSG can be linked to 2 or 3 OCGT units. The following configurations are currently being investigated from a technical perspective:
  * A configuration of 3 x 3:1 (OCGT: HRSG units),
  * A configuration of 2 x 3:1 and 1 x 1:2 (OCGT: HRSG units) and one stand-alone OCGT unit, possibly to be used as "black-start" facility for the power station, and
  * A configuration of 4 x 2:1 (OCGT: HRSG units) and one stand-alone OCGT unit, possibly to be used as "self-start"[3] facility for the power station. This would allow for HRSG technology standardisation.
» A **condenser** which would convert exhaust steam from the steam turbine back into water through a cooling process.
» Depending on the configuration, a **bypass stack** for the CCGT, anticipated to be approximately 60 m in height would be associated with each HRSG.
» **Water treatment plant** for treatment of potable water and production of demineralised water (for steam generation). High quality water would be required for use within the CCGT power generation process. Membranes/ion exchange systems would be required for water treatment on site. A **waste disposal system** for the effluent[4] from the water treatment system would be required. All solid waste generated from this process would be disposed of off-site at a suitably licensed waste disposal facility.
» **Dry-cooled technology** consisting of a system of air-cooled condenser fans situated in fan banks approximately between 25-30 meters above ground.
» **Additional fuel storage facilities** and associated off-loading and other related infrastructure to cater for the increased fuel requirements associated with the higher load factor (i.e. longer operating hours or a mid-merit operating regime[5]).
» An **elevated water tank**, approximately 20 m high, with a holding volume of approximately 2.5 million litres (i.e. water storage for approximately 5 days of operation).

The power station is to be operated as a zero liquid effluent discharge (ZLED) system, i.e. water within the power station would be recycled for re-use in the power station process. No liquid waste from the power station would therefore be discharged.

[3] A power station must be able to kick-start itself in the event of no external power supply being available. Hence this one dedicated unit.
[4] Estimated to be approximately 1,5 m3/day.
[5] Mid-merit capacity is during the daytime from about 6 am to about 10 pm on weekdays.

3.1.1. Investigation of Water Resource Options

Process water will be required for the CCGT power generation process, as well as water for cooling. It is estimated that approximately 500 m^3/day will be required for this purpose. This translates into an annual water requirement of ~1.825 Mm^3/a.

In order to meet this demand, various water resource options have been investigated in terms of technical, economic and environmental criteria, including a) the use of **groundwater** from the underground aquifer in the Atlantis area, b) the use of **wastewater** from the Wesfleur Wastewater Treatment Works, c) the use of **potable water** from the Witzand Water Treatment Works, and d) the use of **desalinated sea water** piped to the power station from the ocean.

From an environmental perspective, the following conclusions were drawn with regards to these water resource options:

a) The use of groundwater from the underground aquifer in the Atlantis area:
A preliminary assessment of supplying the power station from the groundwater resources in the Atlantis area was undertaken by SRK Consulting (refer to Appendix B). The study area was subdivided into eight Groundwater Resource Units (GRUs) in which the aquifer types, groundwater quality, borehole and aquifer yield potential were assessed. The long-term sustainable yield of all the aquifer systems in the study area is conservatively estimated at 6.7 Mm^3/a during periods of normal rainfall. The so-called Atlantis Primary Aquifer System is the only major groundwater resource in the study area and it extends across five of the identified GRUs. This aquifer has, to a large extent, been fully developed. In addition, abstraction of water from the aquifer system is likely to impact significantly on the users in the Atlantis area, as this aquifer is the primary water resource for this area. Therefore, this option was **excluded as a reasonable and feasible alternative** to sustainably supply water to the power station in the long-term.

b) The use of wastewater from the Wesfleur Wastewater Treatment Works:
Both domestic wastewater and industrial effluent from the Atlantis area are treated at the Wesfleur Wastewater Treatment Works, but are treated within separate systems.

Treated domestic wastewater is utilised by the City of Cape Town to recharge the groundwater system of the Atlantis Primary Aquifer System. Consultation with the City of Cape Town revealed that the abstraction of effluent from the domestic wastewater stream would impact on the balance of this system and, as such, on the availability of groundwater within this aquifer, which is the primary source of water to the Atlantis area. This option was not therefore

supported by the City of Cape Town. As a result, this option was **excluded as a reasonable and feasible alternative** to sustainably supply water to the power station in the long-term.

Treated industrial effluent is currently pumped to the sea barrier recharge zone, which is made up of a series of artificial dams located to the west of the Atlantis area within the Koeberg Nature Reserve. The purpose of this system is to maintain the hydrological barrier with the sea, thereby ensuring the quality of the groundwater resource. Through discussions with the City of Cape Town, it has been suggested that the abstraction of a limited volume of water from this system (such as the estimated 500m^3/day) could be possible. However, a concern has been raised that this abstraction could impact on the balance of the groundwater system. Further investigation of the impact of abstraction of industrial wastewater on the balance of the aquifer system would be required to confirm the level of impact. Such an investigation would require extensive modelling to provide meaningful results.

Due to the urgency of the need for the commissioning of the power station, this option is **not considered reasonable and feasible in the short-term**. However, the potential to utilise this option will continue to be investigated from a technical perspective in parallel to the EIA process.

c) *The use of potable water from the Witzand Water Treatment Works:*

The Witzand Water Treatment Works treats and reticulates water from the Atlantis aquifer to the Atlantis residential and industrial areas. From discussions held with the City of Cape Town, it has been established that there is currently spare capacity at the water treatment works (~15 Ml/d) which is abstracted and stored by the Witzand Water Treatment Works for industrial purposes. Eskom would be required to purchase this water from the City of Cape Town, through a commercial agreement. The purchase of water from this water treatment works would minimise the impact on the aquifer system as water is already being abstracted and treated by the City of Cape Town. A water reticulation pipeline passes the Ankerlig Power Station on Neil Hare Road. Eskom have an existing permanent water tap-off point from this pipeline to the Ankerlig Power Station (existing 4 units), and a temporary tap-off point to the power station expansion site (i.e. additional 5 units) where construction is currently being undertaken. The option of using the existing tap-off points, as well as the need for a new tap-off point is currently being investigated from a technical perspective.

This option is **considered to be a feasible and reasonable option** from a technical, economic and environmental perspective. Should this option be implemented, it has been recommended that Eskom provide for on-site storage for a 2-5 day period for use in the event that water cannot be

supplied from the water treatment works. This will require the installation of a water reservoir on the power station site with a capacity of ~2 to 2.5 Ml.

d) *The use of desalinated sea water piped to the power station from the ocean:* The possibility of abstracting water from the sea and desalinating the abstracted water within a Reverse Osmosis (RO) plant located immediately west of the Ankerlig Power Station on the coast was investigated. In order to minimise the length of pipeline required between the coast and the power station, an area of coastline immediately to the west of the Ankerlig Power Station was considered for the location of a sea water abstraction point. Alternative abstraction points along the stretch of coastline between the Koeberg Nuclear Power Station in the south to a site just south of Matroosbaai in the North were identified and screened from an environmental, technical and economic perspective.

As a result of the position of the Koeberg Nuclear Power Station and the restrictions associated therewith, and the rugged nature of the coastline, only one feasible abstraction point within the Koeberg Nature Reserve (approximately 2 km north of the Koeberg Nuclear Power Station) was identified for this proposed point of abstraction and wastewater discharge from the RO plant. Wastewater discharge could potentially impact on the offshore reef, the seal breeding colony located on the island just offshore of the proposed abstraction/discharge point, breeding sites of the oystercatcher (endangered species), and other sensitive marine life. In addition, location of the desalination plant on the coast could impact on potentially sensitive dune systems and vegetation.

A pipeline in excess of 10 km will be required to be constructed. This pipeline will be required to cross potentially sensitive areas within the Koeberg Nature Reserve.

As a result of the potentially significant environmental impact, and the economic considerations, this was **excluded as a reasonable and feasible alternative** to sustainably supply water to the power station in the long-term.

The use of potable water from the Witzand Water Treatment Works has been nominated as the preferred option in the short-term based on technical, environmental and economic constraints.

The potential to utilise industrial wastewater in the medium- to long-term will continue to be investigated from a technical perspective in parallel to the EIA process.

3.1.2. Investigation of Cooling Technologies

A number of cooling technology options for the CCGT have been investigated by Eskom, including dry-cooled technology and wet-cooled technology. Due to financial and technical constraints, **dry-cooling technology (air-cooled condensers)** has been nominated as a preferred option for implementation. Dry-cooling technology is less water-intensive (i.e. uses significantly less water) than wet-cooled technology, and consists of a system of air-cooled condenser fans situated in fan banks approximately 25 – 30 m above ground. In a direct dry-cooled system, the steam is condensed directly by air in a heat exchanger (air cooled condenser) and the condensate is returned to the steam cycle in a closed loop. The air flow is induced solely by mechanical draft (i.e. caused by fans) in the air cooled condensers.

A condenser converts exhaust steam from the steam turbine back into saturated water through a cooling process. This water (condensate) is then fed into a Condensate Polishing Plant (CPP), to treat/polish it to desired qualities, before it is fed back into the HRSG as part of the steam cycle. Regeneration wastes, a highly saline effluent from the CPP, is fed back into the water treatment system from where it will be disposed off as part of regeneration wastes from the demineralisation plant. This waste is typically small in volume and non-hazardous, and as such, could be disposed off either in the sewer system, or off-site. Eskom is currently investigating various disposal options, which will be considered within the EIA phase.

3.1.3. Additional Fuel Storage Facilities

Conversion of the units to CCGT is based on **increased cycle thermal efficiency**. The CCGT units would utilise the **same amount of liquid fuel** (i.e. diesel) as is currently the case for the OCGT units (i.e. approximately 40 tons of diesel/unit/hour) for the same operating regime. However, in order to meet the electricity supply demand in the medium-term, the plant will have to operate for more hours per day than was anticipated for the OCGT plant (i.e. higher than anticipated load factors). Therefore, the power station will not only operate as a peaking power plant[6] as is currently the case, but will contribute to the mid-merit electricity generation supply[7].

This **higher load factor** would require **higher fuel consumption**. **Additional fuel storage facilities** will be required at the Ankerlig Power Station to cater for the increased fuel requirements associated with the higher load factor. Fuel is

[6] Peaking power refers to power generation technology designed to generate electricity during periods of high electricity demand, generally in the weekday mornings from 07:00 to 09:00 and weekday evenings from 18:00 to 20:00.

[7] Mid-merit capacity is during the daytime from about 6 am to about 10 pm on weekdays.

currently transported by road to the Ankerlig Power Station site from the fuel supply point in Milnerton. The installation of a liquid fuel pipeline to the Ankerlig Power Station, as well as transport of fuel by rail is currently being investigated as part of a separate EIA application (DEAT reference number 12/12/20/955) by Bohlweki Environmental. A screening process for route selection has been completed, and the Scoping Process is now underway.

Eskom currently has authorisation to store 16,2 million litres (16 200 m^3) of fuel on the Ankerlig Power Station site. In order to form a fuel storage buffer between actual fuel usage and fuel delivery to the CCGT units at the higher load factor, Eskom proposes the storage of an additional 43,2 million litres (43 200 m^3) of fuel on the power station site, resulting in a total storage capacity of 59,4 million litres (59 400 m^3) on site. An area to the east of the power station expansion has been earmarked for this additional fuel storage (refer to Figure 3.1). Provision would be required to be made for 8 x 5 400 m^3 fuel storage tanks, as well as associated off-loading and other related infrastructure. Security of liquid fuel supply nationally is regulated by the DME[8].

3.1.4. Project Construction Phase

It is expected that the construction of the power station conversion would commence in early 2009, and would take a maximum of 32 months to complete. In order to meet the urgent need for additional electricity generation capacity, Eskom would aim to fast-track this construction timeframe as far as possible.

The number of construction workers required for a project of this nature is still being determined. 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, and the intention is for appropriate accommodation to be sought and provided within the neighbouring residential area.

3.1.5. Project Operation Phase

As is typical of gas turbine power stations, the expected lifespan of the power station is approximately 25 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 power station will be limited. It is estimated that the project will support only about 20 direct employment opportunities (operators/maintainers).

[8] Refer to Energy Security Master Plan – Liquid Fuels, published by the DME.

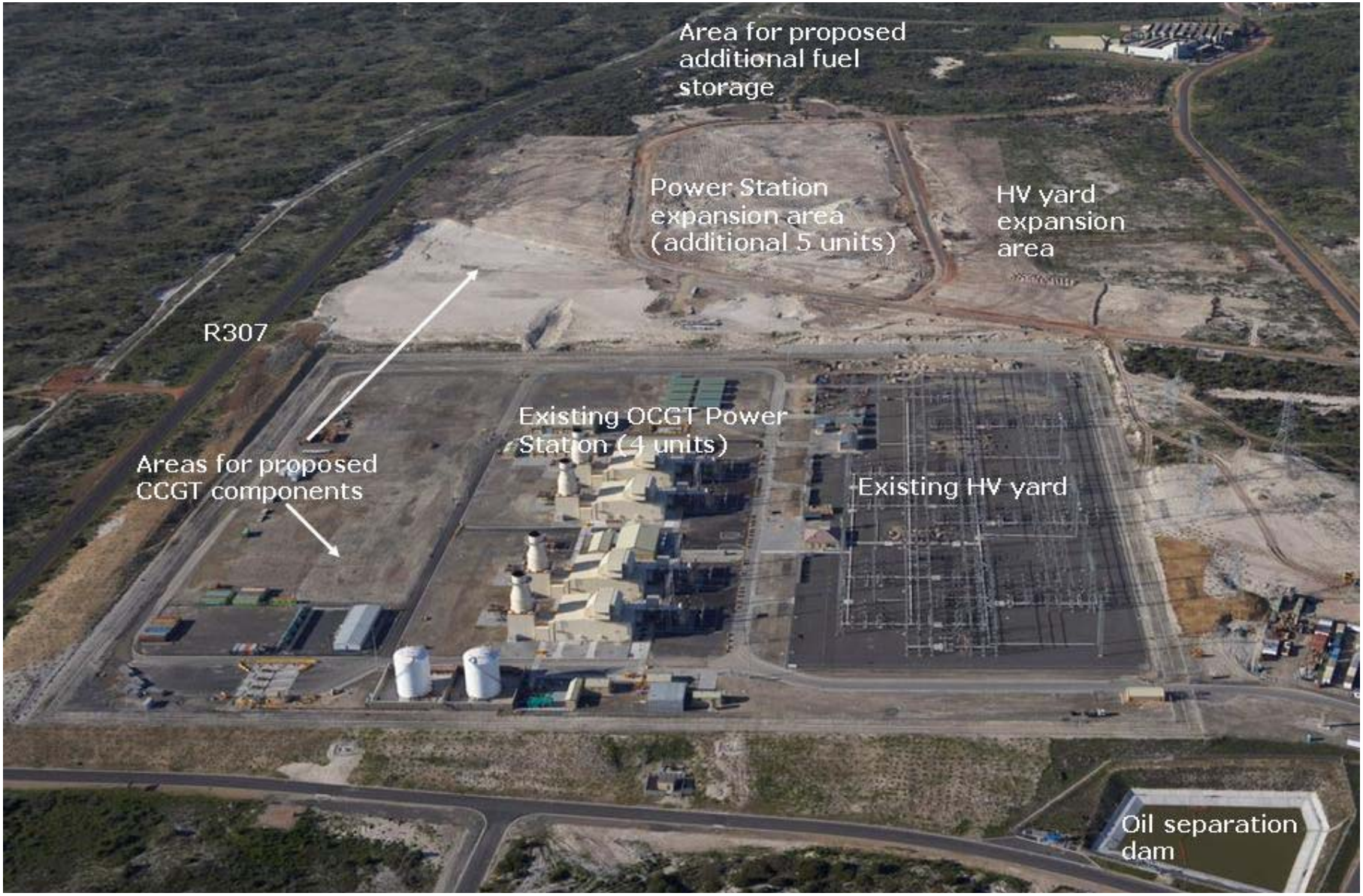


Figure 3.1: Aerial photograph showing Ankerlig Power Station layout and land use

3.2. Integration of the CCGT Power Station into the National Grid

Eskom proposes the construction of a 400kV transmission power line between the Ankerlig Power Station and the Omega Substation (to be constructed on the Farm Groot Oliphantskop 81) to transmit the additional power generated at this power station to the national electricity grid.

One 400kV power line will be sufficient to evacuate the additional power, and would be connect to the now-to-be extended substation (high voltage (HV) yard) at the power station. No expansion of this HV yard is required to accommodate the new transmission power line.

Three technically feasible alternative transmission power line alignment corridors (approximately 500 m in width) have been identified for investigation within the EIA process (refer to Figure 3.2).

Option A (indicated in red on Figure 3.2) runs parallel to the two existing Atlantis-Koeberg 400kV power line servitudes from the Ankerlig Power Station alongside the Atlantis railway line, and then in a south-westerly direction. At Duinenfontein, the route continues straight until it links to the existing Koeberg-Stickland 400kV power line servitude. The line then deviates east across the R303 directly to the Omega Substation at a point situated in the Klein Zoute Rivier Agricultural Holdings (AH).

Option B (indicated in green on Figure 3.2) runs parallel to the two existing Atlantis-Koeberg 400kV power line servitudes from the Ankerlig Power Station alongside the Atlantis railway line. The route then cuts directly southwards over the farms Brakkefontein and Vaatjie as well as the Klein Sout Rivier before joining up with the Koeberg–Stickland 400kV power line servitude. This alignment follows an approximate straight line route from Ankerlig to the Omega substation site.

Option C (indicated in blue on Figure 3.2) follows the Atlantis railway line for its entire length until it reaches the farm Groot Olifantskop (Omega substation). It passes through the properties Brakkefontein, Donkergat, and Vaatjie. The alignment lies to the east of the Brakkefontein Shooting Range, the proposed new regional landfill site and the airstrip utilised by 'Wings over Africa'. The alignment lies to the west of the municipal sewage works, Apollo Bricks and the Corobrick Four Wheel Drive Challenge site.

Through the Scoping Study process, a preferred alternative transmission power line corridor will be nominated for environmental authorisation (by the environmental authorities), provided no environmental fatal flaws are identified to be associated with the proposed project.

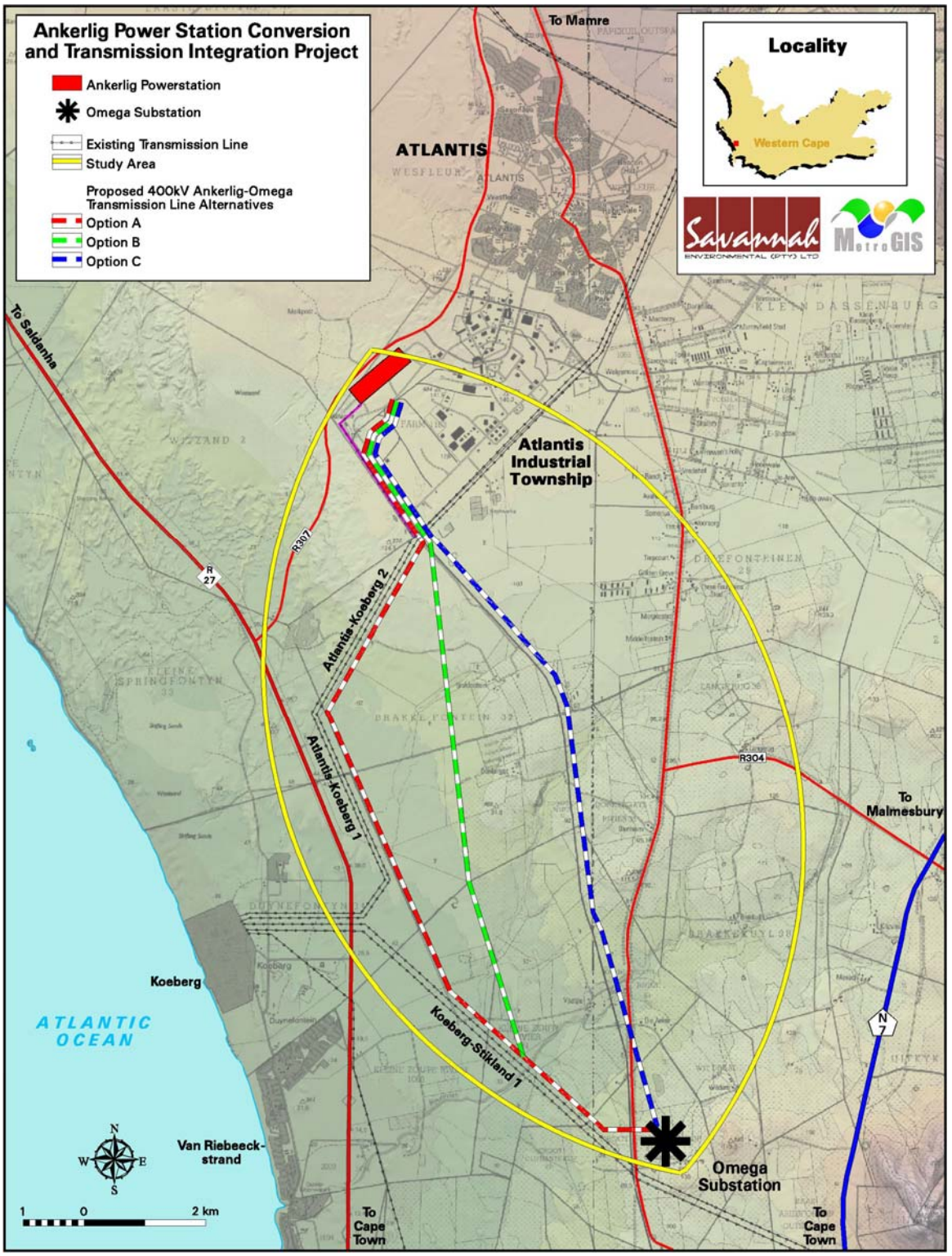


Figure 3.2: Transmission power line alternatives identified for investigation within the EIA process

Transmission power lines are constructed and operated within a servitude (55 m wide for 400kV lines) that is established along the entire length of the line. Within this servitude, Eskom has certain rights and controls that support the safe and effective operation of the line. The process of achieving the servitude agreement is referred to as the Servitude Negotiation Process with each affected landowner. The negotiation process is undertaken directly by Eskom and is independent of the EIA process.

While there should be reasonable confidence in the environmental feasibility of the preferred corridor nominated, other criteria may require minor alteration to the final alignment within the corridor which received environmental authorisation during the land negotiation process undertaken by Eskom. These may include:

» Identification of a technical problem during the detailed design phase which will require excessive cost to resolve (e.g. unstable subsurface conditions identified by detailed geotechnical investigations).
» Request by a landowner during the course of the negotiation process that the alignment be shifted to avoid disruption of a particular activity on his property, but provide a feasible new alignment.

Provided such potential deviations are not unreasonable, it is fair for Eskom Transmission to investigate and negotiate local adjustments within the authorised corridor alignment. This may be required at a number of points along the alignment.

3.2.1. Project Construction Phase

It is expected that the construction for transmission power line will commence in early 2010, and would take approximately 9 months to complete. In order to meet the urgent need for additional electricity generation capacity, Eskom would aim to fast-track this construction timeframe as far as possible.

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.

3.2.2. Project Operation Phase

The expected lifespan of the proposed transmission 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 will be limited, and will be restricted to skilled maintenance personnel employed by Eskom.

APPROACH TO UNDERTAKING THE SCOPING PHASE CHAPTER 4

An Environmental Impact Assessment (EIA) process refers to that process (dictated by the EIA Regulations) which involves the identification of and assessment of direct, indirect and cumulative environmental impacts associated with a proposed project. The EIA process comprises two phases: **Scoping Phase** and **EIA Phase**. The EIA process culminates in the submission of an EIA Report (including an environmental management plan (EMP)) to the competent authority for decision-making. The EIA process is illustrated below:

The Scoping Phase for the proposed Ankerlig Power Station Conversion and Transmission Integration project has been undertaken in accordance with the EIA Regulations published in Government Gazette No. 28753 of 21 April 2006, in terms of Section 24(5) of the National Environmental Management Act (NEMA; Act No 107 of 1998). This Draft Scoping Report aimed to identify potential issues associated with the proposed project, and define the extent of studies required within the EIA. This was achieved through an evaluation of the proposed project involving specialists with expertise relevant to the nature of the project and the study area, the project proponent, as well as a consultation process with key stakeholders that included both relevant government authorities and interested and affected parties (I&APs). This chapter serves to outline the process which was followed during the Scoping Phase of the EIA process.

4.1. Objectives of the Scoping Phase

This Scoping Phase aimed to:

» Identify and evaluate potential environmental (biophysical and socio-economic) impacts and benefits of all phases of the proposed development (including design, construction and operation) within the study area through a desk-top review of existing baseline data and specialist studies.
» Provide the authorities with sufficient information in order to make a decision regarding the scope of issues to be addressed in the EIA phase of the process,

as well as regarding the scope and extent of specialist studies that will be required to be undertaken as part of the EIA Phase of the process.

Within this context, the objectives of this Scoping Phase were to:

» Clarify the scope and nature of the proposed activities.
» Clarify the reasonable and feasible project-specific alternatives to be considered through the EIA process, including the "do nothing" option.
» Identify and evaluate key environmental issues/impacts associated with the proposed project, and through a process of broad-based consultation with stakeholders and desk-top specialist studies identify those issues to be addressed in more detail in the EIA Phase of the EIA process.
» Conduct an open, participatory and transparent public involvement process and facilitate the inclusion of stakeholders' concerns regarding the proposed project in the decision-making process.

4.2. Overview of the Scoping Phase

The Scoping Phase has been undertaken in accordance with the EIA Regulations published in Government Gazette No. 28753 of 21 April 2006 in terms of NEMA.

The potential impacts associated with the installation of 720 MW of additional electricity generation capacity at Ankerlig Power Station, as well as the transmission of this additional power to the national electricity network have been evaluated. Key tasks undertaken within the Scoping Phase included:

» Consultation with relevant decision-making and regulating authorities (at National, Provincial and Local levels).
» Submission of a completed application form for authorisation in terms of Regulation 13 and 27 of Government Notice No R385 of 2006 to the competent authority (DEAT).
» Undertaking a public involvement process in accordance with Regulation 56 of Government Notice No R385 of 2006 in order to identify issues and concerns associated with the proposed project.
» Preparation of an Issues 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 desk-top specialist studies in accordance with Regulation 33 of Government Notice No R385 of 2006.
» Preparation of a Draft Scoping Report and Plan of Study for EIA in accordance with the requirements of the Regulation 29 Government Notice No R385 of 2006.
» Public review of the Draft Scoping Report and Plan of Study for EIA for a 30-day period from 21 January 2008 to 21 February 2008.

» Finalisation and submission of the report to the competent authority.

These tasks are discussed in detail below. Quality control sheets to ensure that all the minimum requirements for the key tasks as listed above are met are included in Appendix C.

4.2.1. Authority Consultation and Application for Authorisation in terms of GN No R385 of 2006

As Eskom is a State-owned Enterprise (SoE), the National Department of Environmental Affairs and Tourism (DEAT) is the competent authority for this application. As the project falls within the Western Cape Province, the Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) acts as a commenting authority for the project. Consultation with these authorities has been undertaken throughout the Scoping process. This consultation has included the following:

» Pre-application consultation with DEAT and DEA&DP regarding the proposed project and the EIA process to be undertaken, including a pre-application consultation meeting with DEAT (27 September 2007).
» Submission of applications for authorisation for the power station conversion and transmission power line to DEAT, with copies submitted to DEA&DP. These applications were accepted and the reference numbers 12/12/20/1014 (power station conversion) and 12/12/20/1037 (transmission power line) allocated. Authorisation was therefore granted to continue with the Scoping Phase of the project. It was agreed that potential impacts associated with both the power station conversion and the transmission power line could be considered within a single report as the two projects are inter-linked. Two separate Environmental Authorisations would, however, be issued.
» Site inspection to the Ankerlig Power Station and proposed transmission power line alternatives on 13 February 2008.

A record of all authority consultation undertaken within the Scoping Phase is included within Appendix D.

4.2.2. I&AP Identification, Registration and the Creation of an Electronic Database

The first step in the public involvement process was to identify relevant stakeholders and interested and affected parties (I&APs). This process was undertaken by **Sustainable Futures ZA** (specialist public participation consultants) through existing contacts and databases, recording responses to site notices and newspaper advertisements, as well as through the process of networking. Stakeholder and I&AP information included on the databases from

the previous EIA processes was verified and included within the database for this proposed project.

Stakeholder groups identified include:

» Atlantis Business Sector
» Localised Civil Society Groupings (Community Based and Non-governmental Organised groups)
» Organised Labour
» Heritage Agencies (National and Provincial)
» Environmental Groupings (Traditional & Energy Sector)
» Provincial Government Departments (departments of relevance within the Western Cape Government)
» Local Authorities (Cape Town Uni City, Blaauwberg Administration, West Coast District Municipality and Swartland Local Municipality)
» National Government Departments (Line Departments)

All relevant stakeholder and I&AP information have been recorded within a database of affected parties (refer to Appendix E for a listing of recorded parties). Databases prepared as part of the previous EIAs undertaken for the Ankerlig Power Station were used as a basis for identifying I&APs and stakeholders for involvement within this current EIA process. While I&APs have been encouraged to register their interest in the project from the start of the process, the identification and registration of I&APs will be on-going for the duration of the EIA process. 470 parties have registered their interest in the project to date. The project database will be updated on an on-going basis throughout the project process, and will act as a record of the parties involved in the public involvement process.

4.2.3. Notification of the EIA Process

In order to notify and inform the public of the proposed project and invite members of the public to register as interested and affected parties (I&APs), the project and EIA process was advertised in the following newspapers:

» Regional newspaper – *Die Burger*: 25 October 2007
» Regional/local newspaper – *Swartland and Weskus Herald*: 1 November 2007
» Regional/local newspaper – *Table talk*: 24 October 2007
» Regional newspaper – *Cape Times*: 25 October 2007

In addition, site advertisements were posted at various locations throughout the study area, i.e.:

- On site: on the fence of the Ankerlig Power Station (a) to the west of Ankerlig Power Station on the link road between Neil Hare Road and Dassenberg Road (R307); (b) at the entrance to Ankerlig Power Station on the fence to the left of the main gate; and (c) on the fence (along Neil Hare Road) at the entrance to the power station expansion construction site.
- Red Door Local Economic Development (LED) Centre
- Wesfleur Library
- Shoprite
- Melkbosstrand Library
- Atlantis Development Forum

In addition to the above advertisements and notices, key stakeholders and registered I&APs were notified in writing of the commencement of the EIA process (notifications sent out on 23 November 2007). These parties included:

- The City of Cape Town and officials within the Blaauwberg Administration (i.e. as the municipality which has jurisdiction in the area)
- The Municipal Councillors and Ward Committee members, as well as ratepayers organisations that represents the communities in the area.
- All the nearby communities and potentially affected landowners
- Neighbouring landowners (Atlantis Business Community)
- Relevant environmental organisations
- Business organisations and other operations in the area (e.g. Atlantis Business Forum and Organised Business Agencies)
- Organs of State having jurisdiction in respect of any aspect of the activity

Copies of the advertisements placed and notices distributed are contained in Appendix F of this report.

4.2.4. 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 application 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 application.
- Comment received from stakeholders and I&APs is recorded.

In order to provide information regarding the proposed project and the EIA process, a background information document (BID) for the project was compiled at the outset of the process (refer to Appendix G). The BID (including a map and a reply form inviting I&APs to register for the proposed project and submit details

of any issues and concerns) was distributed to identified stakeholders and I&APs, and additional copies were made available at public venues within the broader study area. To date, over 500 copies of the BID have been distributed.

Through consultation with key stakeholders and I&APs, issues for inclusion within the issues-based scoping study were identified and confirmed. In order to accommodate the varying needs of stakeholders and I&APs within the study area, as well as capture their views, issues and concerns regarding the project, various opportunities were provided for I&APs to have their issues noted prior to the release of the Draft Scoping Report for public review, as follows:

» **Focus group meetings** (pre-arranged and stakeholders invited to attend)
» One-on-one **consultation meetings**
» Telephonic consultation sessions (consultation with various parties from the EIA project team, including the project participation consultant, lead EIA consultant as well as specialist consultants)
» Written, faxed or e-mail **correspondence**

Table 4.1 below provides details of the formal focus group meetings held during the scoping phase of the public consultation process.

Table 4.1: Details of the focus group meetings held during the scoping phase of the public consultation process

Organisation	Parties Present	Date
City of Cape Town Blaauwberg Administration	Municipal Manager & Heads of Departments	21 November 2007
Atlantis Residents & Ratepayers Association	Members	21 November 2007
Melkbosstrand & Duinefontein Ratepayers Association	Members	21 November 2007
Atlantis Area Development Forum	Members	22 November 2007
Atlantis Local Economic Development Forum	Members	23 November 2007
NACA & Institute of Nuclear Engineers	Mr Mike Longden-Thurgood	23 November 2007

Networking with I&APs will continue throughout the duration of the EIA process. Notes from meetings held with stakeholders and reply forms returned by I&APs are included within Appendix H.

No letter of consent to undertake the EIA (as required in terms Regulation 16(1) of the NEMA EIA Regulations) was required to be obtained, as Eskom is in the

process of purchasing the properties on which the Ankerlig Power Station is located.

In terms of Regulation 16(3), letters of consent were not required to be obtained from landowners along the proposed power line routes, as this is a linear activity. In terms of the requirements of this Regulation, notice of the proposed activity has been given to the owners of the land on which the activity is to be undertaken.

4.2.5. Identification and Recording of Comments and Concerns

Issues and concerns raised by I&APs during the scoping phase have been synthesised into a Comments and Response Report (refer to Appendix I). The Comments and Response Report includes responses from members of the EIA project team and/or the project proponent. The responses indicate how the issues will be addressed in the EIA process, or clarification is provided. 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.

4.2.6. Evaluation of Issues Identified through the Scoping Process

All components of the proposed power station conversion project (as discussed in Chapter 3) will be on the site of the existing Ankerlig Power Station, and will not require any additional land take outside of the existing power station boundaries. Specialist studies undertaken within the two previous EIA processes for the existing OCGT units at Atlantis considered potential impacts on the entire site under consideration. As these EIA processes were recently undertaken (i.e. within the last 2 years) and the sites have been already disturbed through construction activities, it was not considered necessary to commission new specialist investigations into site-specific issues associated with the following:

» Heritage
» Ecology, flora and fauna
» Geology, soil conditions and erosion potential
» Soils, agricultural areas and potential
» Groundwater
» Tourism potential
» Access and transportation

Information collected within the previous studies undertaken and the conclusions drawn are assumed to be sound and based on legislated requirements. These studies have been reviewed and verified, and the relevant findings incorporated within this Draft Scoping Report.

The conversion of the existing OCGT units to CCGT may alter the nature and/or extent of a number of issues as a result of the addition of components and the change in technology being utilised. In this regard, the following specialist studies have been included in this Draft Scoping Study for the power station conversion:

» Visual scoping study
» Air quality scoping study
» Noise scoping study
» Flora scoping study for the proposed additional fuel tank storage site[14]
» Social assessment

The findings and conclusions of the previous specialist studies undertaken in this regard for the OCGT units have been used as a basis for the specialist investigations[15].

In addition, the proposed transmission power line could impact on various aspects of the environment. In this regard, the following specialist studies have been undertaken:

» Visual assessment
» Heritage assessment
» Ecology, flora and fauna assessment
» Avifauna assessment
» Social impact assessment

Potential issues (both direct and indirect environmental impacts) associated with the proposed project identified within the scoping process have been evaluated through desk-top studies. In evaluating potential impacts within the Scoping Phase, Savannah Environmental has been assisted by the following specialist consultants:

Specialist	Area of Expertise	Refer Appendix
Demos Dracoulides of DDA	Air quality and noise scoping study for the power station conversion	Appendix J
Lourens du Plessis of MetroGIS	Visual scoping study and GIS mapping for the power station conversion and	Appendix K

[14] Specialist input with regards to potential impacts on biodiversity is required due to DEA&DP's recent requirement for offset mitigation in potentially sensitive areas. This study would provide a recommendation in this regard in the EIA Phase.

[15] A Heritage Impact Assessment is not required as the area for the additional fuel tank storage is less than 5 000 m^2 in extent (refer to the NHRA).

Specialist	Area of Expertise	Refer Appendix
	transmission power line	
Liezl Coetzee of Southern Hemisphere	Social scoping study for the power station conversion and transmission power line	Appendix L
Nick Helme of Nick Helme Botanical Surveys	Vegetation scoping study for the proposed fuel tank area on the power station site and power line	Appendix M
Prof. Le Fras Mouton of the Department of Botany & Zoology, Stellenbosch University	Terrestrial fauna scoping study for the proposed transmission power line	Appendix N
Andrew Jenkins of the Endangered Wildlife Trust (EWT)	Avifauna scoping study for the proposed transmission power line	Appendix O
Tim Hart of the Archaeology Contracts Office, Department of Archaeology: University of Cape Town	Heritage scoping study for the proposed transmission power line	Appendix P

In order to evaluate issues and assign an order of priority, it was necessary to identify the characteristics of each potential issue/impact:

» *the nature,* which includes 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) or regional

The evaluation of issues has resulted in a statement regarding the potential significance of the identified issues, as well as recommendations regarding detailed investigations of these issues and other specialist studies required within the EIA phase (refer to Chapter 8). Recommendations regarding the methodology to be employed in assessing potential impacts have also been made (refer to Chapter 9).

Specialist Scoping Reports are contained within Appendices J - P.

4.2.7. Assumptions and Limitations

The following assumptions and limitations are applicable to the studies undertaken within this Scoping 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.
» The wealth of information already in hand from the EIA process undertaken for the initial OCGT projects provide a baseline from which this EIA process finds a point of departure.
» This report and its investigations are project-specific, and consequently the environmental team did not evaluate any other power source alternatives.
» As the proposed power station conversion is to be undertaken within the Ankerlig Power Station site, no site alternatives have been investigated as part of this EIA process.

4.2.8. Public Review of Draft Scoping Report and Public Feedback Meetings

The Draft Scoping Report was made available for public review from 21 January 2008 to 21 February 2008 at the following locations:

» www.eskom.co.za/eia
» www.savannahSA.com
» Wesfleur Library
» Atlantis Residents and Ratepayers Association office
» Red Door Local LED Office
» Atlantis Development Forum Office
» Avondale Library
» Melkbosstrand Residents and Ratepayers Association
» Melkbostrand Library

A hard copy and an electronic copy of this draft report was also provided to the City of Cape Town: Blaauwberg Administration for review and comment as a key stakeholder.

In addition, copies of this Draft Scoping Report have been made available to:

» DEAT (Directorate: Environmental Impact Assessment; Directorate: Biodiversity; and Directorate: Air Quality)
» DEA&DP (Directorate: Integrated Environmental Management; and Directorate: Air Quality Management)
» Heritage Western Cape

In order to facilitate comments on the Draft Scoping Report, a public meeting and a stakeholder workshop were held during the review period as follows:

» Key stakeholder workshop: 13 February 2008 at the Koeberg Visitors Centre at 09:30 – 12:00
» Public feedback meeting: 13 February 2008 at the Rebecca Van Amsterdam Hall (Protea Park) at 19:00 – 21:00

The public review process and details of the public meeting were advertised in regional and local newspapers: Die Burger, Cape Times, Table Talk and the Swartland and Weskus Herald (refer Appendix F). 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 workshop by letter (refer to Appendix F). Minutes from these meetings are included within Appendix H.

4.2.9. Final Scoping Report

This is the **current stage** of the process. The final stage in the Scoping Phase has entailed the capturing of responses from I&APs on the Draft Scoping Report in order to refine this report. It is this final report upon which the decision-making environmental Authorities provide comment, recommendations and acceptance to undertake the EIA Phase of the process. It has been made available to DEAT and DEA&DP.

4.3. 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.

4.3.1. 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.
» *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.

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 Koeberg and Blaauwberg sub-councils of the City of Cape Town Metropolitan Municipality.

» In terms of the Municipal Systems Act (Act No 32 of 2000) it is compulsory for all municipalities to go through an Integrated Development Planning (IDP) process to prepare a five-year strategic development plan for the area under their control. The IDP process, specifically the spatial component (Spatial Development Framework), in the Western Cape Province is based on a bioregional planning approach to achieve continuity in the landscape and to maintain important natural areas and ecological processes.
» By-laws and policies have been formulated by local authorities to protect environmental resources relating to issues such as air quality, community safety, etc.

4.3.2. Legislation and Guidelines that have informed the preparation of this Scoping Report

Acts, standards or guidelines relevant to the establishment of the OCGT Power Station at Atlantis were identified in the previous EIA processes undertaken for the Ankerlig Power Station. Those Acts, standards or guidelines which have informed the project process and the scope of issues evaluated in this Scoping Study are summarised in Table 4.2.

The following guidelines have informed the scope and content of this Draft Scoping Report:

» Guidelines published in terms of the NEMA EIA Regulations, in particular:
  * **Guideline 3:** General Guide to Environmental Impact Assessment Regulations, 2006 (DEAT, June 2006)

- **Guideline 4:** Public Participation in support of the Environmental Impact Assessment Regulations, 2006 (DEAT, May 2006)
- **Guideline 5:** Assessment of alternatives and impacts in support of the Environmental Impact Assessment Regulations, 2006 (DEAT, June 2006)
- Guideline on Public Participation, 2006 (DEA&DP, July 2006)
- Guideline on Alternatives, 2006 (DEA&DP, July 2006)

» Specialist study guidelines published by DEA&DP (June 2005)

Table 4.2: List of applicable legislation and compliance requirements required for the Ankerlig Power Station conversion and transmission integration project, 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 GN 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 and DEA&DP in support of the **application for authorisation** submitted in August 2007.
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 phase 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 would 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 J).
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) would be associated with the proposed project (as water will be obtained from the City of Cape Town water treatment works), **no water use permits or licenses** would be required to be applied for or obtained. The City of Cape Town would be required to reflect Eskom's water use from the water treatment works within their water balance which

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
			is submitted to DWAF.
National Water Act (Act No 36 of 1998)	In terms of Section 19, Eskom as the project proponent must ensure that reasonable 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.	Department of Water Affairs and Forestry (as regulator of NWA)	While **no permitting or licensing requirements** arise directly by virtue of the proposed project, this section will find application during the EIA phase 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 - Chief Air Pollution Control Officer (CAPCO)	Eskom have applied for an emissions permit for the current operations at the Ankerlig Power Station and are in consultation with CAPCO in this regard. Eskom may need to **obtain an amended registration certificate** from the Chief Air Pollution Control Officer (CAPCO) at DEA&DP in the event that the emissions from the power station are altered as a result of the proposed conversion project. Eskom must ensure that the conditions in the certificate are complied with at all times.
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; » any development or other activity which	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	The area proposed for the location of the CCGT units associated with the power station conversion project is within the existing Ankerlig power station site. This area has been disturbed through construction activities associated with the OCGT power station. No heritage sites are

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
	will change the character of a site exceeding 5 000 m^2 in extent. The relevant Heritage Resources Authority must be notified of developments such as linear developments (such as roads and power lines), bridges exceeding 50 m, or any development or other activity which will change the character of a site exceeding 5 000 m^2; or the re-zoning of a site exceeding 10 000 m^2 in extent. This notification must be provided 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.	heritage and structures (grade 3a – 3c sites) and prehistoric human remains	expected to be located within this area (Tim Hart, personal communication). Therefore, **no permits** would be required to be obtained. An **HIA** will be required to be undertaken for the proposed power line. An **HIA** may be required to be undertaken for the proposed water pipeline to the power station, depending on the length and location of this pipeline. A **permit** may be required should identified **cultural/heritage sites** along the proposed transmission power line 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	National Department of Environmental Affairs and Tourism	As Eskom would 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 power station site. Specialist flora and fauna scoping studies have been

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
	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 the EIA phase.		undertaken for the proposed power line (refer to Appendices M -O). Detailed specialist studies will be required to be undertaken for the nominated preferred alternative. As the power station site has been disturbed through construction activities associated with the OCGT power station, **no protected plant species** are likely to be present on the proposed development site. Therefore, **no permits** will be required to be obtained in this regard. A **permit** may be required should any **protected plant species** within the power line corridor 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 phase and will continue to apply throughout the life cycle of the project. In this regard, soil erosion prevention and soil conservation strategies would need to be developed and implemented. In addition, the existing weed control and management plan within the EMP would need to be implemented.

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
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 power station conversion and transmission integration project, **no mining permit or mining right** would be 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 personnel for extinguishing fires as are prescribed or in the absence of prescribed requirements, reasonably required in the circumstances.	Department of Water Affairs and Forestry	While **no permitting or licensing requirements** arise from this legislation, this Act would find application during the operational phase of the project.
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	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** would be required to be obtained from the Department of Health.

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
	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.		
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	Western Cape Department of Transport and Public Works (provincial roads) South African National Roads Agency (national roads)	AN ABNORMAL LOAD/VEHICLE PERMIT WOULD BE REQUIRED TO TRANSPORT THE VARIOUS CCGT AND POWER LINE COMPONENTS TO SITE FOR CONSTRUCTION. THESE INCLUDE: » Route clearances and permits will be required for vehicles carrying abnormally heavy or abnormally dimensioned loads. » Transport vehicles exceeding the

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
	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.		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 with the provisions in the Regulations, unless the Minister of Transport has granted an exemption.	Department of Transport Western Cape Department of Transport and Public Works (provincial roads) South African National Roads Agency (national roads)	Eskom would 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.
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 power station conversion project is planned to be undertaken within 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 would need to submit a land development application for the proposed transmission power line in the prescribed manner and form as

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
			provided for in the Act.
Occupational Health and Safety Act (No 85 of 1993)	Major Hazard Installation Regulations, which apply to installations which have on their premises a quantity of a substance which can pose a risk to health and safety of employees and the public.	City of Cape Town	A Risk Assessment would need to be undertaken to determine if the facility is classified as a MHI. Applications would need to be made in writing for permission: » To erect any MHI » Prior to the modification of any existing MHI, which may significantly increase the risk, related to it (e.g. increased storage or production capacity or alteration of process). Applications would need to be advertised in at least one newspaper serving the surrounding communities, and by way of notices posted within these communities.
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 power station conversion project is planned to be undertaken within 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 transmission 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

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
			rezoning application in terms of Section 17 of LUPO to an alternative appropriate zone would be required. Rezoning is required to be undertaken following the issuing of an Environmental Authorisation for the proposed project.
Provincial Legislation			
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	As the power station site has been disturbed through construction activities associated with the OCGT power station, **no endangered or protected plant species** are likely to be present on the proposed development site. Therefore, **no permits** would be required to be obtained in this regard. A **permit** may be required should any **endangered or protected plant species** within the power line corridor be **disturbed or destroyed** as a result of the proposed development.
Local Legislation			
City of Cape Town Air Pollution Control By-Law 12649- 4 February 2004- Provincial Gazette Extraordinary 5979	Section 7: No person shall install, alter, extend or replace any fuel-burning equipment on any premises without the prior written authorisation of the Council, which may only be given after consideration of the relevant plans and specifications.	City of Cape Town	Eskom would need to **obtain written authorisation** from the local council for the alteration of the fuel-burning equipment at the Ankerlig power station (i.e. addition of the CCGT units)

Legislation	Applicable Requirements	Relevant Authority	Compliance requirements
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 would need to **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 would need to 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 would need to ensure that additional fuel tanks proposed to be installed at the 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 the 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.