ENVIRONMENTAL IMPACT ASSESSMENT:
PROPOSED COAL-FIRED POWER STATIONS AND ASSOCIATED INFRASTRUCTURE IN THE WATERBERG, LIMPOPO
NOVEMBER 2008

DRAFT SCOPING REPORT: NON-TECHNICAL SUMMARY

PURPOSE OF THE DRAFT SCOPING REPORT

The purpose of the Scoping Report Phase is to identify and outline potential positive and negative environmental impacts (both biophysical and social) associated with the proposed project. The Scoping Report identifies alternatives and aspects which will require specialist investigation and assessment during the EIR Phase.

Please review this non-technical Summary and preferably the full draft Scoping Report, and submit your comments on the proposed project by 9 January 2009. Either complete a Response Form, write a letter, call or e-mail the public participation office. All EIA documents will also be available on the Eskom www.eskom.co.za/eia and the Ninham Shand websites www.ninhamshand.co.za

An Open house and public meeting will be held on Wednesday 26 November 2008 at Mogol Club Conference Centre, Lephalale from 16h00 to 18h00 and 18h00 to 20h00, respectively. The findings of Scoping phase will be presented and there will be an opportunity to raise any issues or concerns.

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What is an Environmental Impact Assessment?

Eskom Holdings (Pty) Ltd (Eskom) is investigating the potential environmental impacts that construction of two coal-fired power stations could have, in the Waterberg area. In terms of the National Environmental Management Act (No. 107 of 1998) (as amended) an Environmental Impact Assessment (EIA) must be undertaken in order for the Department of Environmental Affairs and Tourism (DEAT) to authorise the proposed project. Ninham Shand (Pty) Ltd (Ninham Shand) is undertaking the study on behalf of Eskom.

An EIA is a process that evaluates, at the earliest possible stage, the environmental characteristics of a proposed project and the consequences on the environment and people that live in it. The purpose is to evaluate the potential environmental impacts and to assist the environmental authority in deciding whether or not the project should be authorised. Where negative impacts on the environment are likely to result because of the project, measures can be recommended to mitigate or lessen these impacts to a level where they are acceptable. The process also gives Interested and Affected Parties (I&APs) an opportunity to comment and to be kept informed about decisions that may impact on them or on the environment.

This document is a non-technical summary of the Scoping Report for the EIA. The aim is to explain what is proposed and why it is necessary. The alternatives that will be considered in terms of the type of technology and where to locate the proposed power stations are explained. The impacts that are expected to occur are described and an outline of how this study plans to look at the impacts in the next stage of the study is given. The summary cannot replace the comprehensive Scoping Report, but it gives an overview of what is contained in that document.

Why are the power stations needed?

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 the surplus electricity generation capacity of the national electricity utility, Eskom, and has progressively reduced the electricity reserves.

It is expected that the reserve margin will continue on a downward trend for the next six years until new base-load power plants are built (2014). In spite of new capacity coming on line, which includes the returning back to service of mothballed power stations such as Camden, Grootvlei and Komati, and building Open Cycle Gas Turbines (OCGT) in Mossel Bay and Atlantis, Western Cape, the electricity demand within the country is still higher than available capacity. Eskom is stepping up the implementation of its capacity expansion programme and is in the process of constructing two coal-fired power stations, Kusile near Witbank and Medupi near Lephalale, Ingula pumped storage scheme near Ladysmith and extending the Atlantis and Mossel bay Open Cycle Gas Turbines (OCGT's) by adding four and two additional units respectively. Additional base load and peaking options are required to meet the growing demand. Eskom is therefore investigating nuclear and coal-fired power stations and intend to start construction on peaking plant and wind in the near future

This EIA is for the proposed construction of two new coal-fired power stations and associated infrastructure in the Waterberg.

Why coal?

It is known that there may be a number of negative environmental impacts associated with the production of electricity from coal. There is growing pressure to find alternative ways of producing electricity, especially from renewable energy sources such as wind, solar, hydro and gas. Although these other forms of energy are being pursued, coal-fired and nuclear power stations are, and will remain for some time, the two primary electricity supply options available in South Africa. The main reason for this is that coal-fired and nuclear power stations are able to produce the bulk of electricity required throughout the day, referred to as base load capacity.

Eskom is currently expanding its base load capacity through the construction of the Medupi Power Station in the vicinity of Lephalale, and the Kusile Power Station, in the Mpumalanga Province.

Furthermore, a potential nuclear power station option is currently being evaluated through an EIA process (referred to as Nuclear 1). However, in addition to the nuclear options, several coal-fired power stations are still required.

What about global warming?

Carbon dioxide (CO_2) is the primary greenhouse gas released from fossil-fuel burning facilities, such as coal-fired power stations. Greenhouse gases trap reflected long-wave radiation leaving the earth's surface, which leads to warming of the earth's lower atmosphere.

The Kyoto Protocol was developed to be a specific and binding agreement on the reduction of greenhouse gas emissions. In terms of South Africa's Kyoto commitments South Africa, as a Non-Annex 1 country, is not obligated to make any comparable cuts, only to monitor and report on its carbon emissions.

Eskom has an obligation to provide electricity for all South African citizens, with due consideration of the international perspective in terms of global warming in terms of its National Climate Change Response Strategy commitments. Eskom's climate change strategy is summarized in its six-point plan:

(i) Adaptation to the negative impacts of climate change;

(ii) Diversification of the energy mix to lower carbon emitting technologies;
(iii) Energy efficiency measures to reduce demand and greenhouse gas and other emissions;
(iv) Innovation through research, demonstration and development;
(v) Investment through carbon market mechanisms; and
(vi) Progress through advocacy, partnerships and collaboration.

How do these coal-fired power stations work?

These coal-fired power stations will produce electricity by burning pulverised coal in a boiler to heat water to produce steam. The steam flows at a very high pressure into a turbine, which rotates a generator or alternator at a high speed to produce electricity. The steam is then condensed back into water and returned to the boiler to be recycled through the process again.

Where will the power stations be located?

The Waterberg region was identified as a location for further coal-related development due to the size and availability of the coal field, the depth to coal and the mostly unallocated coal resources in the area.

Expressions of interest for supplying coal to the power stations were called for and a range of coal supplies were offered to Eskom. The coal source for the proposed power stations has however not yet been finalized.

What is proposed?

Eskom is proposing to construct two power stations, in a phased manner. The power station precincts would include the power station buildings, administration buildings (administrative, medical, maintenance, services) and the high voltage yards. The likely associated infrastructure[1] includes, amongst other things, a water treatment works, a wastewater treatment works (WWTW), access roads, transmission lines, railway line, water supply pipelines, a coal stockyard, an ash disposal facility, a coal and ash conveyor system, and water storage facilities. The two power stations are unlikely to be able to share infrastructure, due to their distance and the likely project phasing (the power stations would not be constructed simultaneously), and therefore there is little opportunity to reduce infrastructural requirements.

The extent of the site required for such power stations and ancillary infrastructure is at least 2 000 ha, plus an additional 3 000 ha for a permanent above-ground ashing facility, adjacent to the power station area.

Where in the Waterberg?

A number of criteria were considered in the identification of the candidate sites. These included, amongst others, a location which is substantively off-coal, proximity to the coal resource within a feasible transportation distance, minimum 5 000 ha footprint, existing boundaries (roads, railways, major powerlines and farm boundaries), buffer zones around residential areas and other infrastructure

Based on the above criteria three candidate sites were identified (refer to Figure 1). These are as follows:

Site A (area approximately 8 328 ha)
Minnaarspan Farm No. 322
Zyferbult Farm No. 324
Taaiboschpan Farm No. 320
Zandheuwel Farm No. 356

[1] A separate EIA process will be undertaken for the development of a coal mine to supply coal to the power station.

Leliefontein Farm No. 672
Portion of Doornlaagte Farm No. 353

Site B (area approximately 7 377 ha)
Pyppan Farm No. 326
Mooipan Farm No. 325
Knopjesdoorn Farm No. 351
Portion of Doornlaagte Farm No. 353
Schuldpadfontein Farm No. 328]
Rooibokbult Farm No. 330
Portion of Paardevley Farm No. 329

Site C (area approximately 8 122 ha)
Dwars-in-die-Weg Farm No. 289
Gifboschpan Farm No. 288
Witkop Farm No. 287
Rooiboklaagte Farm No. 283
Haakdoornpan Farm No. 673
Haakdoornhoek Farm No. 333
Vaalboschhoek Farm No. 285

What are the alternatives at a project level?

Alternatives that are proposed for consideration in the EIR phase of the project are the following:

- Three candidate site alternatives
- Combustion technology alternative
  - Focused on pulverised fuel combustion
- Cooling technologies
  - Indirect dry cooling
  - Direct dry cooling and
  - Stack-in-tower dry cooling
- Ash disposal alternatives
  - Focused on above-ground ashing
- Site layout alternatives

What impacts are expected?

Coal-fired power stations and their associated infrastructure can impact on a range of biophysical and socio-economic aspects of the environment. Impacts can result from the construction phase as well as the operational phase. While the construction phase impacts are usually short term, some may have longer lasting effects, such as if the groundwater is polluted. A construction phase Environmental Management Plan (EMP) will be compiled to be implemented during the construction phase to manage these aspects.

The operational phase impacts are usually considered to be the long term impacts associated with the project and these will be considered by a suite of specialists during the EIR phase. The specialists will also consider ways to manage these potential impacts and these mitigation measures will be included in an operational phase EMP. The Environmental Impact Report will contain a framework EMP which broadly considers how the potential construction and operational phase impacts would be managed.

Because each of the components of a power station can have a range of impacts on the environment, a number of specialists have been tasked with investigating certain aspects which require more detailed investigation. Specialists will be appointed to investigate amongst others, the following:

Air quality
Power stations emit various common pollutants during the combustion of coal. These atmospheric emissions are potentially harmful to human health, as well as to natural ecological processes and may impact at a greater level in terms of global warming.

Noise
Power stations are associated with a significant level of noise, related to the operations, as well as associated road and rail traffic. The cooling fans (if direct dry cooling is used) are the most significant source of noise. Other infrastructure that

generates noise includes the conveyor belt system for the coal supply and ash removal (specifically the conveyor belt drive houses) and the ash disposal spreading operations.

Visual

The large scale and industrial nature of power stations change the way the landscape looks. The cooling towers (if indirect cooling is used), the flue gas stacks and boilers, as well as above ground ash disposal facility are visually dominant. Surface infrastructure includes dams, the coal stockyard and water and wastewater treatment facilities. The coal conveyor can also be visually intrusive in the landscape.

Terrestrial ecology and Toxicology

The establishment of power stations and their associated infrastructure potentially destroys habitat that may be important for biodiversity and ecosystem processes. This includes construction of roads, railway lines, conveyors and pipelines, which extend beyond the footprint of the power station precincts. Increased levels of dioxides of sulphur (SO_x) emitted from the power stations can also damage vegetation and could impact upon the game animals in the surrounding area.

Aquatic ecology

Habitat that may be important for aquatic biodiversity and ecosystem processes may be destroyed during the construction process. This includes construction of roads, railway lines, conveyors and pipelines, which extend beyond the footprint of the power stations. Dust blown from above-ground ash dumps can also impact significantly on aquatic systems (causing a decrease in the ecological health of rivers and the integrity of wetlands and pans), while the increased levels of SO_x can damage aquatic vegetation.

Groundwater

The power stations' surface infrastructure includes dams, a coal stockyard, and water and wastewater treatment facilities. Process chemicals and liquid fuel, as well as liquid waste products from the operation of the power stations could contaminate the groundwater resource in the area. Contamination of groundwater would affect users of groundwater in the area and may impact in terrestrial and surface aquatic ecosystems.

Societal risk

Power stations require a suite of chemicals to be stored and used on site, during the operation of the stations. Chemicals required include amongst others, chlorine, ammonia, caustic soda and sulphuric acid. Diesel, petrol and bunker oil would also be required and stored on site. A chemical–related emergency could affect the health of employees as well as people in the vicinity of the power stations at the time of the emergency. The environment could also be detrimentally affected.

Heritage resources

The extensive bulk earthworks and excavations for the establishment of a power station may result in the destruction or damaging of archaeological or cultural (heritage) material on site, along roads and pipeline routes.

Socio-economic

Power stations potentially have a positive impact on local communities and economic development, through the major investment of money into the area. However, there may be negative impacts on human health, as well as changes (positive or negative) in property values, as a result of the developments.

Social

The farms comprising the sites would have to be purchased by Eskom. The loss of land for farmers may have an impact on the security of many farmers' livelihoods. The loss of farms also affects the farm-worker community, who may struggle to find alternative employment. Lastly, the farmers and local residents who are not bought out

for the development are likely to experience a change in the social environment in which they live.

Land use planning

The two proposed power stations will require some 5 000 ha of land each, in an area which is currently predominantly used for agriculture. The proposed power stations are likely to deviate from the proposed land use patterns identified in the local planning.

Traffic

Power stations need to be linked by access roads to the existing road network. Construction and operational activities can cause an increase in vehicular traffic on the existing roads in the region. This may result in the need for increased maintenance requirements or road upgrades.

Agriculture

The loss of agricultural land is likely to be significant for individual landowners, due to the potential impact that the project could have from a livelihood security perspective.

The specialists appointed to undertake the above-mentioned studies include:

- Air quality impact assessment: AirShed Planning Professionals
- Noise impact assessment: Jongens Keet Associates
- Visual impact assessment: Strategic Environmental Focus
- Terrestrial ecology assessment (including toxicology): Makecha Development Association and InfoTox
- Aquatic ecology assessment: Golder Associates
- Groundwater assessment: GCS
- Societal risk assessment: Riscom
- Archaeological impact assessment: Johnny van Schalkwyk (private consultant)
- Socio-economic assessment: Urban-Econ
- Social impact assessment: Ptersa Environmental Management Consultants
- Land use planning study: Winterbach, Potgieter and Associates
- Traffic assessment: Ndodana Consulting Engineers
- Agricultural potential assessment: Ivuzi Environmental Consulting

Public participation is a very important part of the EIA process, as it allows I&APs to get information about what is proposed, to

What is the Public Participation Process?

provide input and to voice any concerns, at defined stages throughout the project.

The Draft Scoping Report for the proposed coal-fired power station will be available for review from 5 November 2008 at the following venues:

Place	Address
Agri Lephalale	6A Jacobus Street, Lephalale
Lephalale Local Municipality	Cnr Dou Water and Joe Slovo Drive, Onverwacht
Lephalale Public Library	Cnr Dou Water and Joe Slovo , Onverwacht
Marapong Clinic	175 Mosethla Street
Lephalale District Agricultural Union	NTK Building, Louis Botha Avenue, Lephalale

It will also be available on the Eskom (www.eskom.co.za/eia) and Ninham Shand (www.ninhamshand.co.za) websites.

The Draft Scoping report will be presented at an open house and public meeting at the Mogol Club Conference Centre on 26 November 2008 from 16h00 to 18h00 and 18h00 to 20h00, respectively. You have an opportunity to submit comments and concerns until 9 January 2009, after which the report will be updated, where necessary, to reflect the comments and concerns raised.

What is the way forward?

The Draft Scoping Report will be finalised to reflect comments and concerns received, and will then be submitted to DEAT. DEAT will either reject the application or instruct the applicant to proceed to the EIA phase, either as proposed in the Plan of Study for EIA, or require that amendments be made to the Scoping Report and/or Plan of Study for EIA before continuing.

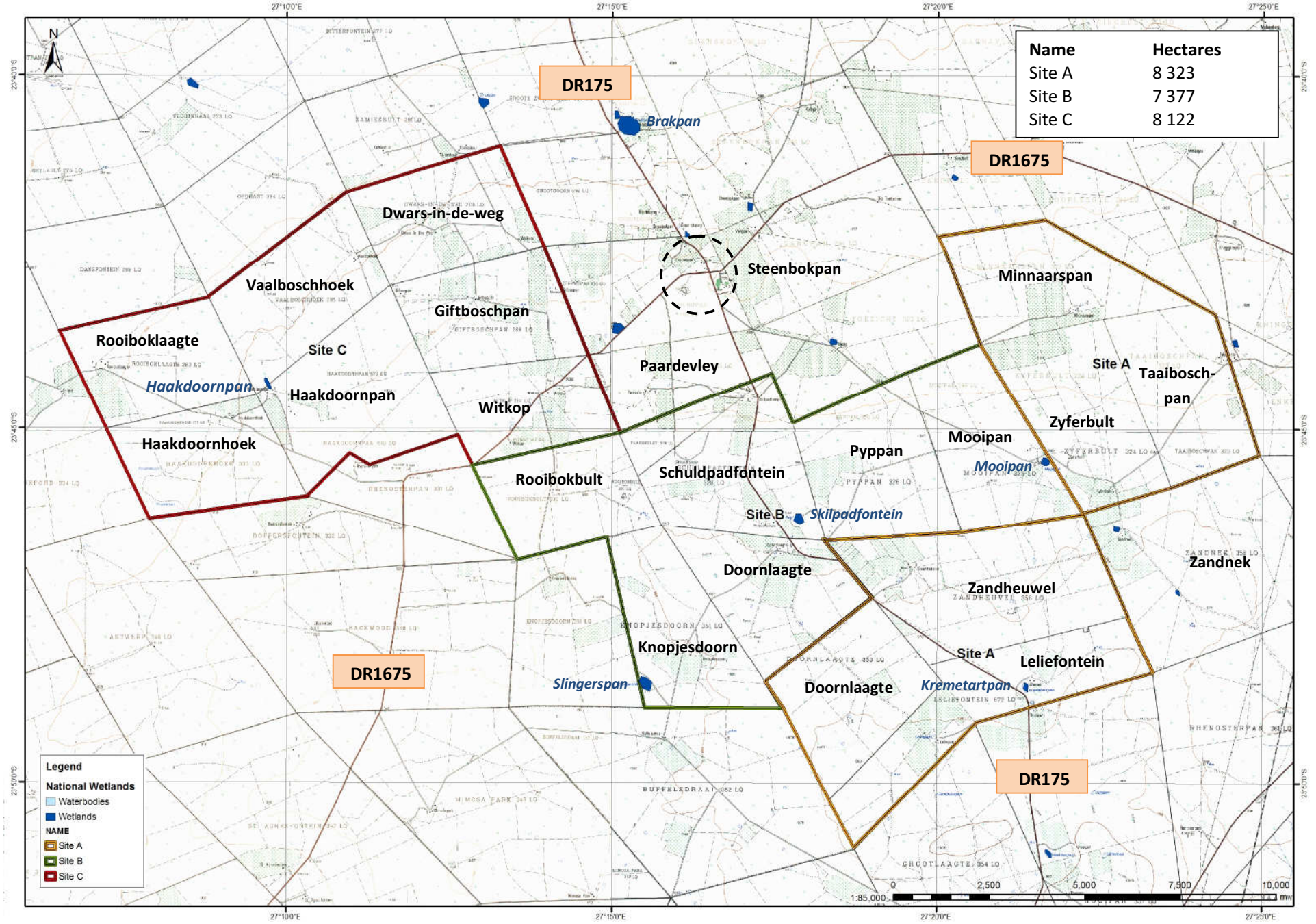

Figure 1 Proposed sites