5 THE PUBLIC PARTICIPATION PROCESS

The purpose of this chapter is to provide a summary of the Public Participation Process to date and the way forward with respect to the process as part of the EIA phase of this project. A summary of the key issues raised by I&APs to date is also provided.

5.1 INTRODUCTION

Consultation with I&APs forms an integral component of an EIA process (see **Figure 1.2**) and enables *inter alia* directly affected landowners, neighbouring landowners, stakeholders, communities and interested parties to identify the issues and concerns relating to the proposed activity, which they feel should be addressed in the process. The approach to this public participation process, summarised in the Plan of Study for EIA (**Chapter 7**), has taken cognisance of the DEAT guideline on Stakeholder Engagement (2002).

Public participation, as required in terms of the EIA Regulations can, in general, be separated into the following phases:

Initiation of the Public Participation Process

- During this phase I&APs are notified of the initiation of the environmental investigation, to enable them to raise issues and concerns at the outset of the investigation.

Comment on the Draft Reports

- During the Scoping and EIR phases, registered I&APs are provided with an opportunity to comment on draft versions of the reports. This is enabled by the lodging of the reports at suitable locations and invitations to public meetings/open houses to discuss the content of the relevant report.

Decision and Appeal period

- This is the final phase of the public participation process. Once the competent authority have made their decision and issued an Environmental Authorisation, the applicant and I&APs are notified of the decision and have the opportunity to appeal to the National Minister of Environmental Affairs and Tourism.

Progress with respect to these various stages for the current project is discussed in more detail below. It should be noted that the public process developed for this investigation exceeds the minimum requirements of NEMA. The Public Participation Process is being facilitated by Zitholele Consulting, a consulting firm, which has extensive experience in stakeholder engagement and facilitation.

5.2 INITIATION OF THE PUBLIC PROCESS

The approach adopted for the current investigation was to identify as many I&APs as possible initially, through a suite of activities, including placing public notices in national, regional and local newspapers, visiting many of the potentially affected landowners and identifying I&APs from other databases in the area. Thereafter, the remainder of the communications will be focused on registered I&APs and on regional advertising. Consequently, the initial advertising campaign was broad and thorough and invited the members of the public to register as I&APs.

5.2.1 COMPILATION OF THE I&AP DATABASE

The initial database of I&APs was compiled using a list of stakeholders provided by Eskom, using the I&AP database for the Medupi Power Station, and through liaison with the local municipality, agricultural unions and other organisations in the area. Furthermore, an extensive survey of potentially directly affected landowners was undertaken, where representatives from the Public Participation Team contacted all the potentially directly affected landowners telephonically and provided information in the form of a BID, and an invitation to attend a Landowners and Agricultural Sector Meeting.

The initial database included directly affected landowners, relevant district and local municipal officials, relevant national and provincial government officials, and stakeholders from previous studies. This database is augmented via chain referral, and is continually updated as new I&APs are identified throughout the project. The current list of I&APs, comprising approximately 200 individuals and organisations, is included in **Annexure D**. The sectors of society represented by I&APs on the database are listed in **Table 5.1** below.

Table 5.1 Sectors of society represented by I&APs on the database

• National government • Provincial government (Limpopo) • Local government (district as well as local municipality) • Organised agriculture • Business/Commerce • Environmental and conservation organisations • Industry • Education: local schools	• Local landowners (on the three alternative sites) • Local communities, including tribal authorities, women's groups, development committees and other community based organisations (CBOs) in the project area • Media (print and broadcast) • Transport	• Water organisations (Irrigation Boards, Water Boards, Water Committees, and Water User Associations) • Non Government Organisations • Researchers and consultants • Tourism

5.2.2 COMPILATION AND DISTRIBUTION OF BACKGROUND INFORMATION DOCUMENT

A BID for the proposed project was compiled in English and Afrikaans, which are the prominent languages used in the region. The BID provided a background to the proposed project and highlighted the legal requirements and EIA process to be followed for the project. A Response Form was enclosed/ attached, inviting I&APs to provide any comments regarding the proposed activities, to identify any further I&APs who should be consulted, and to register on the I&AP database. The BID and a Response Form were distributed via post, fax or e-mail to all I&APs on 16 September 2008. A copy of the BID is included in **Annexure C**. As the BID only included the description of a single power station an urgent letter was distributed to all I&APs who had received a copy of the BID on 1 October 2008. This letter notified I&APs of the change in the project description to include a second power station and the reasons behind this change. A copy of this notice is included in **Annexure C**.

5.2.3 ADVERTISING IN THE NATIONAL, REGIONAL AND LOCAL NEWSPAPERS

Advertisements for the EIA process appeared in a suite of national, regional and local newspapers between 15 September and 19 September 2008, as reflected in **Table 5.2**. The advertisements provided a background to the proposed activities and EIA process, and invited members of the public to register as I&APs, and raise any issues or concerns. Copies of the advertisements are included in **Annexure C**.

Table 5.2 List of publications including advertisement language and date

Coverage	Publication	Language	Date
National	Sunday Times	English	21 September 2008
	Rapport	Afrikaans	21 September 2008
Regional	The Star	English	15 September 2008
	Beeld	Afrikaans	16 September 2008
	Sowetan	English	17 September 2008
	Citizen	English	18 September 2008
Local	Mogol Post	English	19 September 2008
	Kwêvoël	Afrikaans	19 September 2008
	Limpopo Beat	English	17 September 2008
	Capricorn Voice	English	17-19 September 2008

5.2.4 INITIAL LANDOWNER AND KEY STAKEHOLDER MEETINGS

Initial meetings were held with authorities as well as directly affected landowners and representatives of the agricultural sector on 3 and 4 October 2008, in Lephalale and Steenbokpan, respectively. The main purpose of these meetings was to provide the directly affected authorities and key stakeholders with an opportunity to meet the study team and to raise any initial issues and concerns regarding the project. A brief background to the EIA, site

selection and land acquisition processes were provided at the meeting (the presentations are included in **Annexure C**). The presentations were delivered in English and.Afrikaans. The meetings are listed in the table below.

Table 5.3 List of meetings held during the announcement of the EIA

Date	Venue	Time	Attended by
Friday 3 October 2008	Machauka Lodge, Lephalale	11:00 - 15:00	Authorities of national, provincial and local government. This meeting also included a site visit to the proposed alternative sites.
Saturday 4 October 2008	Steenbokpan in the old NTK Building	10:00 - 13:30	Agricultural sector and landowners

5.2.5 ISSUES AND CONCERNS RAISED

Issues were submitted to the public participation facilitator via telephone, mail, fax, email and at the meetings. Comments and concerns raised by I&APs (see **Annexure E**) with regards to the proposed activities have been incorporated into a detailed 'Issues Trail' which is included as **Annexure F**. The Issues Trail records all the issues and concerns raised by I&APs during the Scoping Process, and provides the project team and proponent's response thereto. The major issues raised by I&APs can briefly be summarised as follows:

Biophysical issues

- Impacts on the ambient air quality of the region;
- Lack of sufficient water for proposed power stations; and
- Decision to pursue the coal-fired power station option, in preference to gas, nuclear or renewable energy options.

Social issues

- Indirect impacts on adjacent landowners;
- Impacts on the social environment and economy;
- Impacts on the sense of character of Steenbokpan; and
- Loss of areas currently utilised for amenity/recreational purposes (i.e. getaways etc)

Economical issues

- Concerns regarding the compensation process and adequacy of the compensation received; and
- Location of the new township.

Planning issues

- Relevance of the EIA when three EIAs previously undertaken in the area;
- Lack of trust between I&APs and Eskom concerning Eskom's long term planning, adherence to mitigation measures in previous EIA's; and
- Separation of the EIA's for the power stations and transmission lines.

5.2.6 MINUTES OF THE INITIAL PUBLIC MEETINGS

Detailed notes were taken during the focus group meetings in order to capture the issues and concerns raised. Thereafter, notes of the meetings were compiled, translated into Afrikaans and distributed to the relevant meeting attendees. Copies of the presentations given at the meetings and copies of the attendance lists were attached and distributed with the meeting notes. The notes of these meetings are included in **Annexure C.**

5.3 COMMENT ON THE DRAFT SCOPING REPORT

The next stage of the public participation process involves the lodging of this Draft Scoping Report (DSR) in public libraries and on the Internet, and the hosting of a Public Meeting / Open House.

The first round of Public Meetings / Open Houses will be held on 26 November 2008 at the following venue:

Date	***Venue***	***Time***
26 November 2008	Mogol Club, Conference Centre, Lephalale	16:00 – 20:00

Note that the formal meeting will only start at 18:00. An Open House will be held before this during which information is on view (e.g. posters and maps) and informal discussions can take place.

The purpose of this meeting is to present the DSR and provide the public with an opportunity to comment on the findings. All registered I&APs were notified of the meetings by means of a letter sent by post, fax or email on 3 November 2008. Furthermore, public notices were placed in the local newspapers between 5 and 7 November 2008, inviting the general public to attend the meetings. The letters of notification also included a copy of the Executive Summary of the DSR and a Response Form for comments in English and Afrikaans. Copies of this DSR have been lodged in the following locations and on the Eskom (www.eskom.co.za/eia) and Ninham Shand (www.ninhamshand.co.za) websites from 5 November 2008:

- Lephalale Local Municipal office, Lephalale;
- Lephalale Public Library, Lephalale;
- Agri Lephalale local office;
- Marapong Clinic (Tlou Street, Marapong); and
- Lephalale District Agricultural Union.

I&APs will have until 9 January 2009 to submit their written comments on the DSR to Zitholele Consulting. Cognisance will be taken of all comments when compiling the final report, and the comments, together with the study team and client's responses thereto, will be included as an annexure in the final report. Where appropriate, the report will be updated.

5.4 REVIEW AND DECISION PERIOD

On completion of the Final Scoping Report it will be submitted to DEAT for their review and decision regarding approval of the Report and related Plan of Study for EIA. DEAT will thereafter issue a letter accepting the Scoping Report and Plan of Study for EIA and advise the EAP to proceed with the tasks contemplated in the Plan of Study, or request amendments or reject the Scoping Report and Plan of Study for EIA.

6 DESCRIPTION OF THE AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS

The purpose of this chapter is to provide a brief description of the affected environment and the potential impacts that could result from the proposed project. Where additional information is required for detailed assessment in the EIR ToR for specialist studies are given.

6.1 INTRODUCTION

The description of the affected environment given below draws on existing knowledge from published data, previous studies, specialist investigations, site visits to the area and discussions with various role-players. The identification of potential impacts which may occur as a result of the proposed activities described in **Chapter 4** of this report is broad, to cover the operational phase as well as the construction phase of the project. In cases where there is currently inadequate information, a draft ToR and proposed specialist consultant is provided. Impacts of lesser importance are also screened out, with reasons, to ensure that the EIR is focused on the potentially significant impacts.

6.2 OPERATIONAL PHASE IMPACTS ON THE BIOPHYSICAL ENVIRONMENT

This section of the report describes the biophysical environment and considers the long-term or operational phase impacts on the biophysical environment that may be associated with the proposed activities, including the following:

- Impact on the terrestrial fauna and flora;
- Impact on aquatic flora and fauna;
- Impact on ambient air quality;
- Impact of founding conditions on the power stations; and
- Impact on groundwater resources.

Long-term impacts on the socio-economic environment are described in **Section 6.3**, while the construction phase impacts are outlined in **Section 6.4**.

6.2.1 IMPACT ON TERRESTRIAL FAUNA AND FLORA

According to Mucina and Rutherford (2006) two vegetation types are found within the vicinity of the candidate sites, namely Limpopo Sweet Bushveld and Western Sandy Bushveld. Note that both vegetation types are listed as Least Threatened.

According to Mucina and Rutherford (2006), Limpopo Sweet Bushveld is found on plains, sometimes undulating or irregular, crossed by several tributaries of the Limpopo River. It forms

short open woodland and in disturbed areas forms impenetrable thickets of Blue Thorn (*Acacia erubescens),* Wait-a-Bit Thorn *(A. mellifera)* and Kalahari Christmas Tree *(Dichrostachys cinerea)*. The succulent herb *Piaranthus atrosanguineus* is a Central Bushveld endemic found in this vegetation type. Limpopo Sweet Bushveld is widespread, extending from the lower reaches of the Crocodile and Marico Rivers down the Limpopo River Valley including Lephalale and north to the Usutu border post as well as into Botswana. This vegetation type is classified as Least Threatened with a conservation target of 19 %. Approximately 1 % is statutorily conserved and 5 % is transformed, mainly due to cultivation. Though limited by low rainfall this vegetation type is good grazing for game and cattle due to the high grazing capacity of sweet veld (Mucina and Rutherford, 2006).

Western Sandy Bushveld occurs on the flats and undulating plains. It varies in form from tall open woodland to low woodland, which has prominent broad-leaved and microphyllous tree species. Dominant species include Blue Thorn (*A. erubescens)* on flat areas, Red Bushwillow *(Combretum apiculatum)* on shallow soils of gravelly upland sites and Silver Clusterleaf *(Terminalia sericea)* on deep sands (Mucina and Rutherford, 2006). Western Sandy Bushveld extends from Assen northwards past Thabazimbi and west of the Waterberg Mountains towards Steenbokpan in the north. This vegetation type is classified as Least Threatened with a conservation target of 19 %. Approximately 6 % is statutorily conserved, mainly in Marakele National Park, and approximately 4 % is transformed, mainly due to cultivation (Mucina and Rutherford, 2006).

Land use at the three candidate sites appears to be similar, with a mix of grazing and game farming. There are no formally protected areas within 25 km of the candidate sites.

Animals in the greater Waterberg region include, amongst others, Nyala antelope (*Tragelaphus angasii)*, white rhino (*Ceratotherium simum)*, giraffe (*Giraffa camelopardalis)*, waterbuck (*Kobus ellipsiprymnus)*, zebra (*Equus burchellii)*, tsessebe (*Domaliscus lunatus)* (classified as Endangered by the Endangered Wildlife Trust (EWT)), eland (*Taurotragus oryx)* and others. It also includes a variety of predators such as leopard (*Panthera pardus)*, brown hyena (*Hyaena brunnea)* (classified as Near Threatened by the EWT), jackal and smaller cats.

The Cape vulture, listed in the Red Data Book by EWT as Critically Endangered, breeds within the Waterberg area. As it nests on cliffs the breeding of Cape vultures would be unaffected by the footprint of the power station which is in a relatively flat area. However, Cape vultures may use the study area for scavenging and could therefore be affected by the proposed project.

The site requirements for the establishment of a coal-fired power station and its ancillary infrastructure is at least 5 000 ha and the average site size is approximately 8 000 ha. The total area would not, however, be disturbed, which would mitigate the impact on flora and fauna partially. It should also be noted that portions of the three candidate sites have been historically disturbed through grazing and game farming. Furthermore, the inherent mobility of most faunal species would enable those communities within the affected area to move away from the construction area to undisturbed land in the immediate vicinity. In the medium to long term, the areas not directly affected by the proposed development could be conserved.

In conclusion, given the limited conservation of Limpopo Sweet Bushveld and Western Sandy Bushveld and the extent of the sites that could be disturbed, it is recommended that a specialist terrestrial ecology assessment be undertaken, focused within the three candidate sites under consideration. The proposed ToR for this specialist study are as follows:

- Undertake an initial site visit with the EIA team in order to obtain an overview of the candidate sites and to refine the ToR.
- Source and review baseline information and participate in the finalisation of these ToR.
- Undertake the requisite field work and compile a report that considers the following aspects:
    - A broad description of the terrestrial ecological characteristics of the candidate sites and surrounds;
    - Identification and description of biodiversity patterns at community and ecosystem level (main vegetation type, plant and animal communities in vicinity and threatened/ vulnerable ecosystems species), at species level (Red Data Book species, presence of alien species) and in terms of significant landscape features;
    - Identification of potential impacts and recommendations to mitigate these;
    - Comment on whether or not biodiversity processes would be affected by the proposed project, and if so, how these would be affected;
    - Provide a preference ranking of the sites in terms of terrestrial fauna and flora, with and without mitigation measures; and
    - Comment on the cumulative impacts of two power stations, as well as developments in the broader area (e.g. Sasol's proposed coal-to-liquids facility).

It is proposed that Dr Johan du Preez of Makecha Development Associates undertake the requisite assessment. He is an ecologist with a doctorate in plant ecology. He has extensive knowledge of the region and experience in undertaking similar assessments, and is also a senior lecture at the University of the Free State.

It is also noted that the emissions of the power station could affect both the communities and the game animals in the surrounding area. Similar concerns were raised during and after the Matimba "B" EIA process (now referred to as Medupi power station). The effects of SO_2, NO_2 and PM_{10} on human health, at levels beyond certain concentrations, are well studied and well known. However, the effects of these irritants on animals are less known and in many cases are completely unstudied. Extrapolating from human health studies, increases in PM_{10} levels could have an impact on the respiratory health of game animals and SO_2 could cause cardiopulmonary effects. NO_2 is believed to enhance the effects of exposure to other known irritants, such as ozone, SO_2 and particulates in humans and it is possible that it could have the same effects in game animals.

Given the large number of game farms in the general vicinity of the proposed candidate sites, it is recommended that an animal toxicology study be undertaken. The proposed ToR for this specialist study are as follows:

- Review of available literature on the toxicity and mode of action of particulates (with a diameter of 10 µm or more) (PM_{10}), sulphur dioxide and nitrogen dioxide in game species;

- Comparison of modes of action of the selected pollutants between game species, based on principles of physiology;
- Review of ambient air concentrations of particulates (PM_{10}), sulphur dioxide and nitrogen dioxide at the receptor location, based on dispersion modelling, considering different averaging times as may be required. Concentrations must take into account background levels of the substances of potential concern;
- Interpret modelled air concentrations of particulates (PM_{10}), sulphur dioxide and nitrogen dioxide in terms of potential health effects on game species.

Dr Jan Myburgh is a qualified veterinarian with over 10 years experience in service rendering (clinical veterinary work) to commercial and small-scale farmers in the Gauteng and Northwest Province. Clinically, he has a special interest in bovine medicine (pharmacology and toxicology) and reproduction. Dr Myburgh currently works for the University of Pretoria and is a senior lecturer in the Department of Paraclinical Sciences and is responsible for teaching Pharmacology and Toxicology to pre- and postgraduate students. Dr Myburgh will be working under the auspices Dr Willie van Niekerk of Infotox.

6.2.2 IMPACT ON AQUATIC FLORA AND FAUNA

The Waterberg falls within the Limpopo primary catchment and more specifically the Mokolo and Matlabas Key Areas, which drain into the Limpopo River to the north. Although the Sandloop (a tributary of the Mokolo), Limpopo and Matlabas Rivers are the nearest to the candidate sites these are approximately 29 km (east), 20km (north) and 20 km (west) away, respectively (see **Figure 6.2**). The Sandloop, Limpopo and Matlabas Rivers are categorised as having a Present Ecological Status of Class C, moderately modified, with the Limpopo and Matlabas Rivers being perennial and the Sandloop River non-perennial (Driver *et al*, 2004).

The Mokolo Key Area appears to be in balance currently and DWAF has noted that no further allocations should be made from surface water without carrying out detailed analyses to verify a sustainable source of supply (DWAF, 2004).

The Matlabas Key Area is a dry catchment with non-perennial flow and hence no sustainable yield from surface water. The limited water use in this catchment is mostly from groundwater, which is under-exploited (see **Section 6.2.4** below). DWAF has noted that new allocations in this Key Area can only be made from groundwater or from additional yield which could be created by the construction of farm dams (DWAF, 2004).

However, the Lephalale area has been earmarked as a growth node by the provincial government and it is anticipated that the water demand will increase with new developments proposed such as new or expanded mining activities, new power stations and other developments. DWAF has consequently taken note of the proposed developments and is proposing an augmentation scheme to increase the supply in the Mokolo Water Management Area (WMA). Options being considered include (see
Figure 6.1 showing possible augmentation options below):

- the re-allocation (temporarily or permanently) of the Mokolo Dam water;

- and/or the raising of the Mokolo Dam; and
- transferring surplus effluent return flows from the Crocodile West / Marico WMA .

A transfer pipeline from the Crocodile River (West), to augment the water requirements of the Mokolo catchment is the preferred long term option for implementation. A Feasibility Study for this option is currently underway (pers.comm. W Comrie).

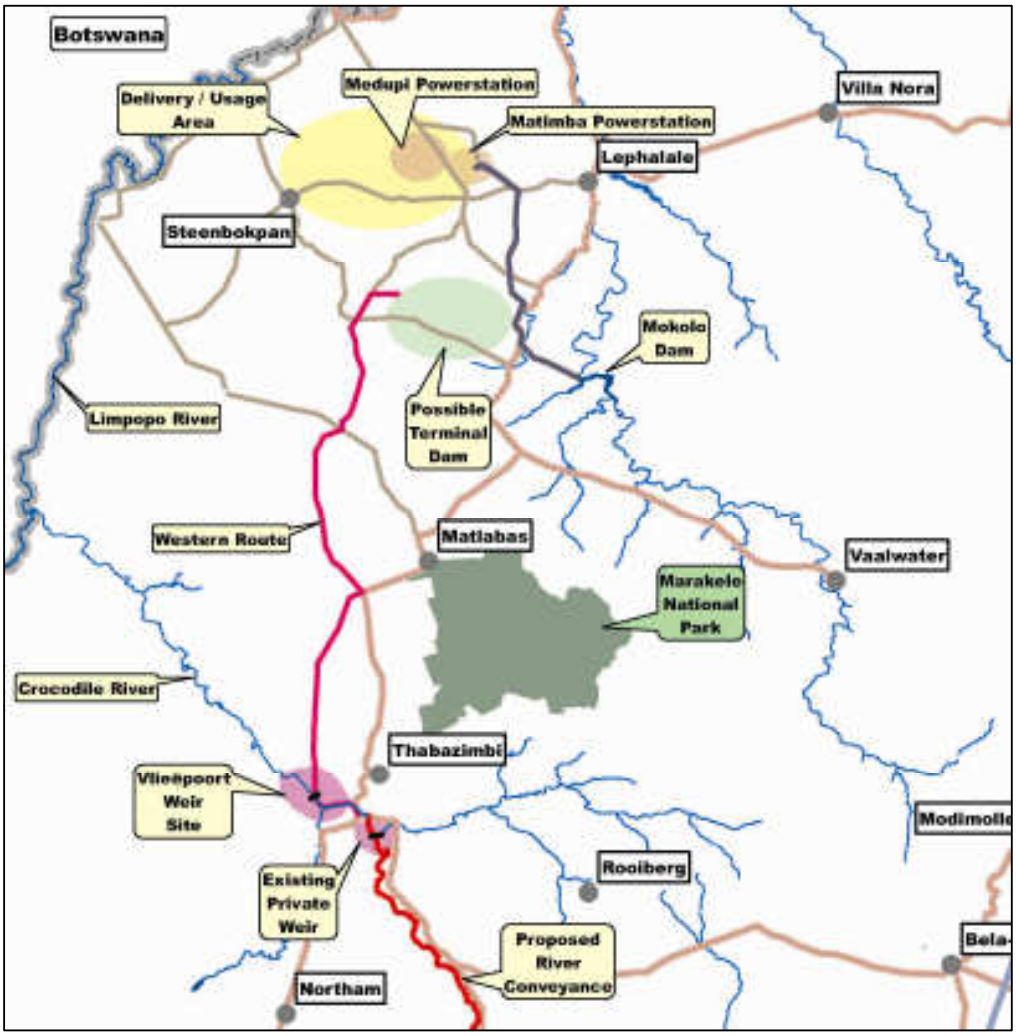


Figure 6.1 Locations of possible augmentation schemes

Within the candidate sites five pans (classified as wetlands) are found (see **Figure 3.3**) with an average area of 4.2 ha. The largest pan, Slingerspan on Knopjesdoorn farm, is 8.1 ha in extent. The largest pan in the surrounding area is Brakpan approximately 3 km east of Site C which covers an area of 25.6 ha.

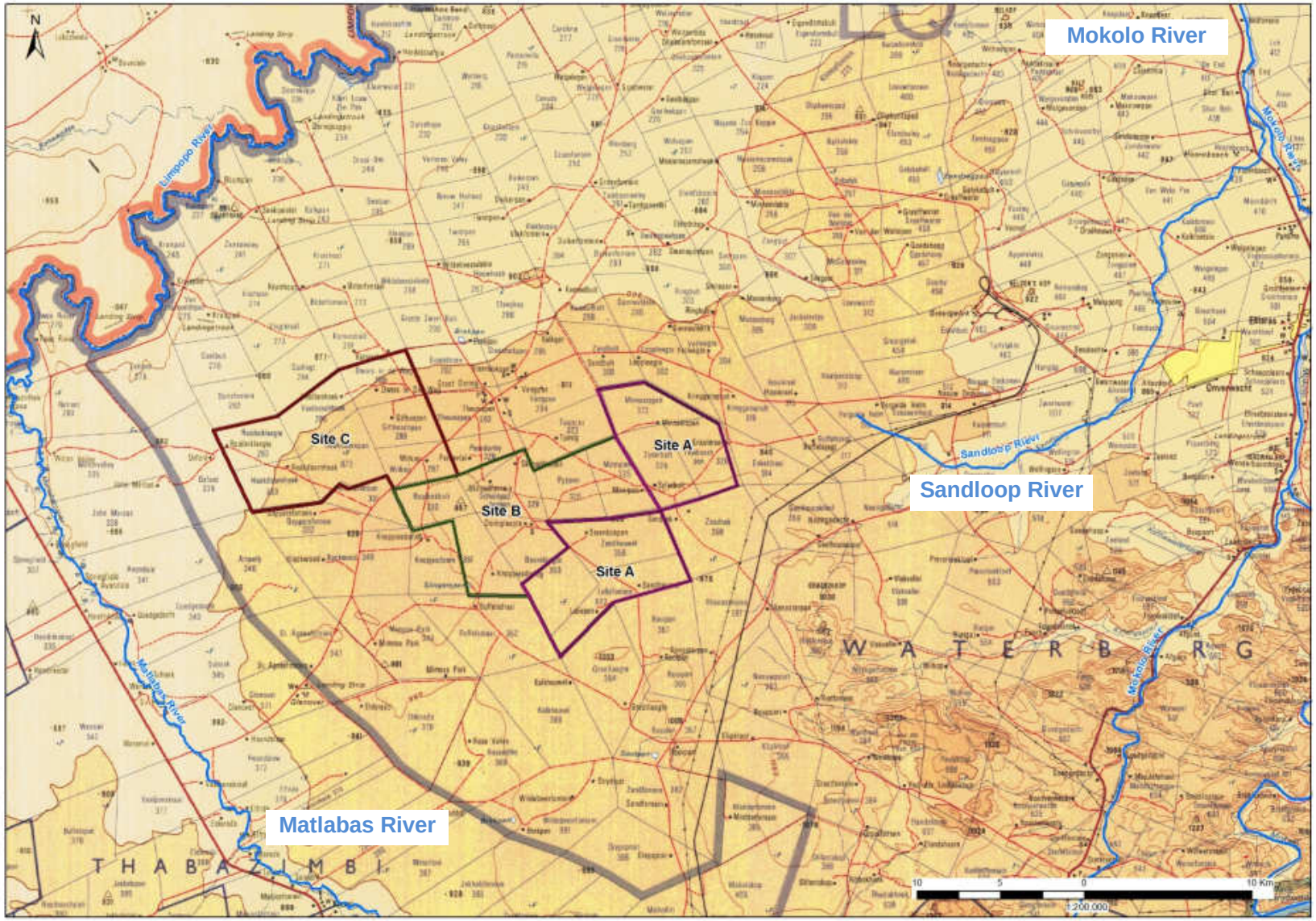


Figure 6.2 Rivers found in proximity to the candidate sites

South Africa recognises the importance of its wetlands as sensitive ecosystems that require conservation, and accordingly has become a signatory to the international Convention on Wetlands of International Importance (also known as the Ramsar convention). While there are no Ramsar listed wetlands in the vicinity of the candidate sites, the importance of wetland conservation is noted.

As mentioned previously, the proposed power station would require approximately 5 000 ha of land, even though only a portion of this would be developed with the power station infrastructure, and a portion being used mainly for the creation of an ash disposal facility and a coal stockyard. The proposed development could therefore have an impact on the extent and integrity of any wetlands on the candidate sites. Furthermore, any run-off and leachate from the ash disposal facility and coal stockyard could contaminate any wetlands, if not dealt with effectively, affecting their ecological integrity and functioning.

Given the importance of the conservation of water resources in South Africa, specifically wetlands it is recommended that an aquatic ecological assessment be undertaken. The proposed ToR for this specialist study are as follows:

- Undertake an initial site visit with the EIA team in order to obtain an overview of the candidate sites and to refine the ToR.
- Undertake an initial desktop study of reputable sources to compile an expected species list and to focus the aquatic ecology study.
- Undertake the requisite field work and compile a report that considers the following aspects:
    - Broad description of the aquatic ecology of the candidate sites and surrounding wetlands and streams including aquatic assessment and habitat classification;
    - Delineation of wetlands, utilising DWAF's approved methodology;
    - Identification and description of biodiversity patterns at community and ecosystem level (plant and animal communities in vicinity and threatened/vulnerable ecosystems species), species level (Red Data Book species, presence of alien species) and in terms of significant landscape features (e.g. wetlands);
    - General comment on whether ecosystem processes would be affected (including comment on how these would be affected);
    - Identification of potential impacts and recommendations to prevent or mitigate these;
    - Offer an opinion on site rankings in terms of aquatic ecosystems including wetlands, with and without mitigation measures; and
    - Comment on the cumulative impacts of two power stations, as well as developments in the broader area (e.g. Sasol's proposed coal-to-liquids facility).

Golder Associates, an environmental services consulting firm, lead by Mr Daniel Otto, has been appointed to undertake the aquatic ecological assessment. Mr Daniel Otto has over 16 years experience in aquatic hydrology and has assisted in research such as passive treatment wetland projects and *A Manual on Mine Water Management and Treatment Practices in South Africa*. Mr Otto has lectured at the Vista University in Johannesburg and has also worked as a researcher. Mr Otto specializes in environmental rehabilitation, environmental management plans implementation, audits, liability assessment and environmental risk assessment audits.

6.2.3 IMPACT ON AMBIENT AIR QUALITY

The three candidate sites are located within the Waterberg region, near Lephalale. Coal mining operations at the Grootegeluk mine, the Matimba power station and the Medupi power station (currently being constructed), and a brick works located at Hanglip are all located within 25 – 30 km of the candidate sites. Furthermore, household fuel burning, veld fires, windblown dust from the area and agricultural activities, vehicle exhaust emissions and cross-boundary pollution from Botswana, in particular further contribute to atmospheric pollution in the area. The ambient air quality in the near vicinity of these areas was recently studied by Airshed Planning Professionals (2006) for the siting of the Medupi power station. The following findings were noted:

- SO_2 concentrations were found to infrequently exceed short term air quality limits at several monitoring stations. Given that short-term limits are exceeded due to the operations of the existing power station (Matimba) it is likely that the addition of Medupi power station will increase the frequency of exceedance downwind of the power stations. However, the Environmental Authorisation authorizing the Medupi power station was issued with the condition that Medupi power station and the Matimba power station should be fitted with SO_X abatement technology, should monitoring in populated areas indicate non-compliance with South African ambient air quality standards, in order to ensure compliance with these standards.
- Predicted PM_{10} concentrations were within the South African daily and annual limits but exceeded the more stringent South African National Standards (SANS) and European Union limit values in the vicinity (within 4 km) of the existing ash dump at the Zwartwater farm and the proposed Medupi ash dump on the Eenzamheid Farm.
- NO_2 concentrations were found to be below local and international air quality limits (including the predictions for the proposed Medupi power station emissions).

The establishment of the two proposed power stations is likely to result in a range of emissions including SO_x, NO_x, CO_2 gases as well as particulate matter being emitted into the atmosphere. Furthermore, other coal-related developments are also being considered in the area, most notablely Sasol's investigation into the establishment of a coal-to-liquids plant in the area, which will add further pressure to the air shed. Further afield, coal developments are taking place, such as in Botswana, which should be noted.

Oxides of sulphur, oxides of nitrogen, as well as particulate matter and heavy metals would all be emitted from the power stations. The emission of sulphur dioxide (SO_2) and oxides of nitrogen oxide is likely to have an impact on the biophysical environment and on human health and could possibly result in cumulative impacts due to the existing industries. Health aspects are further considered in **Section 6.3.3** below. Furthermore, the emission of carbon dioxide into the atmosphere contributes to global warming with concomitant impacts on global climate change and concomitant human and ecological wellbeing both locally and internationally.

As noted in **Section 4.3.4** above, Eskom has committed to installing a suite of appropriate atmospheric emission abatement technologies to reduce its atmospheric emissions, including technologies to reduce oxides of sulphur emissions (flue gas desulphurisation), particulate removal (bag filters or electrostatic precipitators) and boilers that produce low NO_X emissions.

As air quality is one of the key factors affecting the proposed project it is recommended that a detailed air quality assessment be undertaken. The ToR for this study are as follows:

- Undertake an initial site visit with the EIA team in order to obtain an overview of the candidate sites and to refine the ToR.
- Establish baseline conditions, by:
    - Describing the atmospheric dispersion potential of the area based on available meteorological data.
    - Describing existing sources of atmospheric emissions in the area.
    - Describing the existing air quality, especially with respect to particulates, oxides of sulphur and oxides of nitrogen.
    - Providing an overview of legislative and regulatory requirements pertaining to atmospheric emissions and ambient air quality, including local and international air quality guidelines and standards.
    - Initial screening dispersion modelling of power station configuration scenarios to provide input into air quality technology alternatives that may be considered.
    - Validation of the dispersion model, by comparing the model results to measured data from a suite of local monitoring stations.
- Predict potential impacts of the proposed power stations by:
    - Compiling a comprehensive emissions inventory for the construction and operational phases of the project and taking into account:
    - Three operating scenarios:
        1. 6 x 900 MW (nominal), pulverised fuel, with FGD on any one site alternative,
        2. 6 x 900 MW (nominal), pulverised fuel, with FGD on any two site alternatives (i.e. two power stations),
        3. A worst case of two 6 x 900 MW (nominal), pulverised fuel, with FGD power stations and the proposed Sasol coal-to-liquids facility.
    - Construction phase emissions e.g. site clearance and earthworks,
    - Operational phase emissions e.g. ashing operations, raw materials handling, waste disposal and power station stack emissions,
    - Emissions during routine and emergency conditions,
    - Emissions during shutdowns,
    - Selecting and populating of a suitable air dispersion model,
    - Undertaking stack height screening modelling to inform recommendations regarding a suitable stack height,
    - Applying the air dispersion model to determine incremental and cumulative pollutant concentrations in the ambient air as a result of both the construction and operational phases of the proposed power stations,
    - Assessment of air quality impacts including:
        1. Evaluating estimated emissions,
        2. Comparing estimated emissions to local and international limits,
        3. Evaluating emissions in terms of global warming potential, within the context of South Africa's last reported contribution to greenhouse gases,
        4. Evaluating (a) magnitude, frequency of occurrence, duration and probability of impacts, (b) local, regional national and international

significance of predicted impacts, and (c) level of confidence in findings,
    - Recommendation of mitigation measures to address predicted impacts.
- Compile an air quality assessment report that documents the tasks mentioned above.
- Compile an air quality management plan in consultation with Ninham Shand and Eskom, for incorporation into the construction and operational phase Environmental Management Plan (EMP) to be developed for the proposed power station. The air quality management plan would include:
    - Identification of mitigation and management measures to meet required control efficiencies,
    - Liaising with Eskom to determine stack height and develop ambient monitoring measures, and
    - Documentation of the monitoring, mitigation and management measures for integration into the project EMP.

Airshed Planning Professionals, led by Dr Lucian Burger, has been appointed to undertake the air quality impact assessment. Lucian Burger is the Managing Director of Airshed Planning Professionals. His postgraduate studies were specifically focused on the development of dispersion modelling theory and related software applications.

6.2.4 IMPACT OF FOUNDING CONDITIONS ON THE POWER STATION

The Waterberg area is mainly flat, with some rolling plains. It is bordered to the east by the Waterberg Mountain Range, the most prominent topographical feature in the district, and the Limpopo River to the north east.

a) Lithology

The lithology of the Waterberg area comprises several geological sequences:

- The oldest rocks, lying to the south of the area, are sedimentary rocks comprising the Waterberg Group. This comprises quartzitic sandstones, conglomerates and grits. The dip of the strata is generally to the south and south west at shallow angles (5˚ to 20˚). The Waterberg rocks are intruded by sills (more horizontal orientation) and dykes (more vertical orientation) of pre-Karoo diabase.
- Overlying these, in the main part of the study area, are rocks of the Karoo Supergroup, Ecca Group (sandstone grit and shales with coal seams (Middle Ecca) and carbonaceous shales with coal seams (Upper Ecca)).
- Higher up the geological sequence, and outcropping to the north, are rocks of the Karoo Supergroup, Molteno Elliot and Clarens Formation (mudstone and sandstone) with some Drakensberg Formation basalt. Coal seams also occur in the Molteno Formation.

Refer to **Figure 6.3** for the lithology found within the broader area. There do not appear to be any major recorded faults or lineations crossing the area.

b) Founding conditions

As mentioned in **Chapter 3** above, the power station would have to be located on an area which is free of coal, to avoid sterilising coal reserves. Consequently, it is likely that the power station and associated infrastructure would be positioned on either:

i) Waterberg Group rocks (to the south): Suitable founding with adequate bearing capacity for heavy equipment would be on sound rock at shallow depth. Although aeolian (windblown) sands with a collapsible fabric or expansive soils derived from the weathering of local diabase intrusions could occur at the surface, these problems could be overcome with the appropriate foundation design; or
ii) Karoo sandstones (to the north/east): Generally little weathering takes place where sandstones are cemented with silica and competent founding conditions are likely at reasonably shallow depths (pers.comm. M Wynne).

c) Seismic Hazard

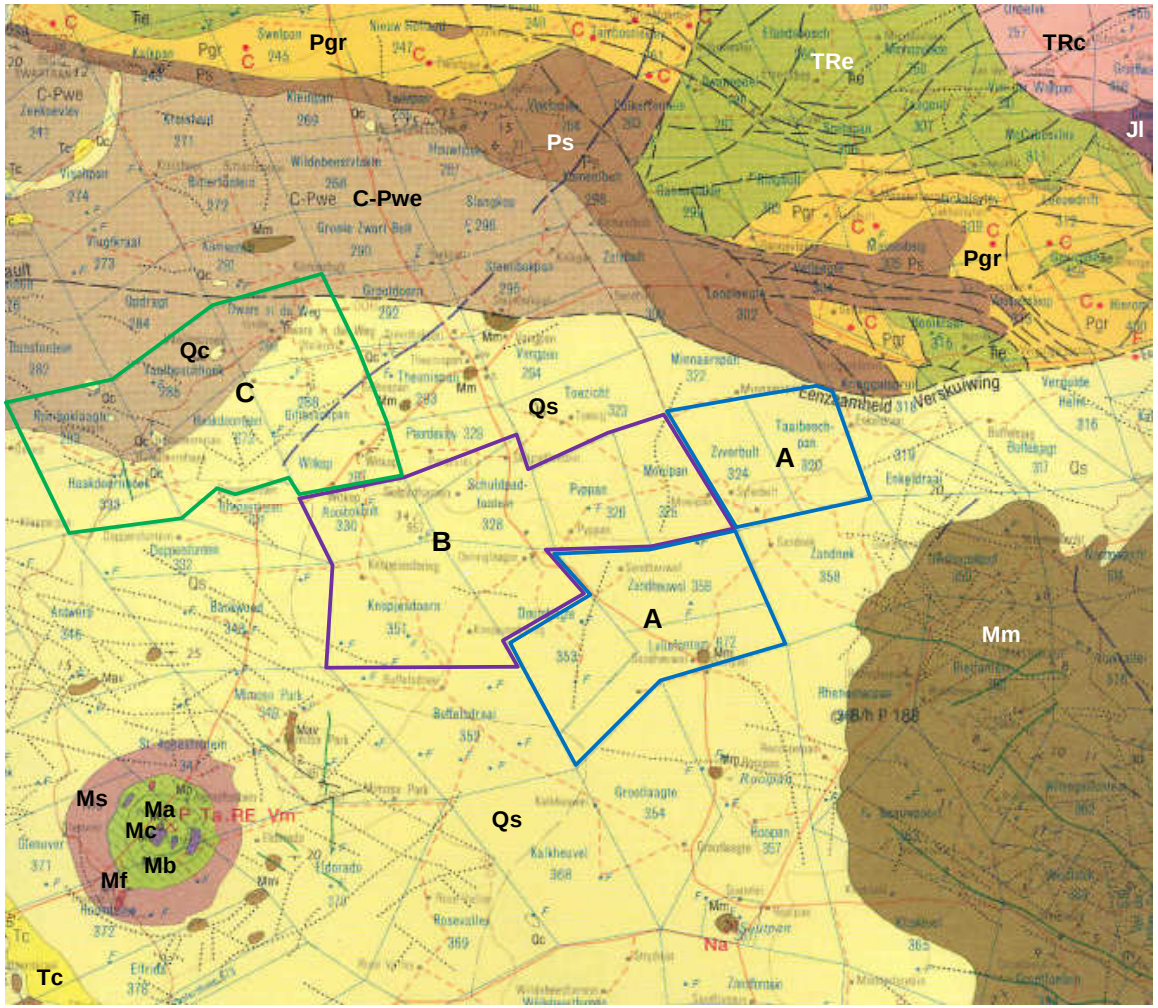
From the Probabilistic Seismic-Hazard Maps the site lies in a region with a low expected seismic level. The peak ground acceleration (g) is about 0.03 with a 10 % probability of being exceeded in a 50-year period. Possible seismic activity in the Waterberg area would only be associated with local mining activity (e.g. stope closure underground). There is no severe probability of such activity in the area, since most of the current and proposed mining is opencast. However, at design stage, the appropriate “earthquake” base factors should be used in structural design calculations (pers.comm. M Wynne).

As issues have arisen at the construction phase in previous power station sitings due to insufficient detailed geotechnical information, such as at the Medupi power station site, a detailed investigation of the geological conditions is being undertaken by Eskom. Information from the geotechnical study will be reflected in the EIA where relevant.

6.2.5 IMPACT ON GROUNDWATER RESOURCES

The Waterberg Group and Karoo Supergroup sediments and volcanics underlie the area. **Figure 6.3** illustrates the geology of the area and is described in more detail in **Section 6.2.4** above.

Based on regional data from the 1: 500 000 hydrogeological map (Sheet 2326 Polokwane), the following can be noted of the formations in the region:



KEY			
Group	**Complex/Formation**	**Map Symbol**	**Lithology**
Waterberg Group		Qs	Sandy soil
Waterberg Group		Qc	Ferricrete
	Glenover complex (area of Glenover Phosphate mine to the south west of the candidate sites. Minerals previously mined here are tantalum/niobium, rare earths, vermiculite and phosphate.	Ma	Apatite breccias
		Mc	Carbonatite
		Mb	Biotite complex
		Mf	White fenite,
		Ms	Fenitised sandstone; minor red fenite
		Tc	Calcerous sandstone and conglomerate, consolidatedsoil covered by red sand
Waterberg Group	Mogalakwena group	Mm	Coarse-grained purplish brown sandstone
Karoo Group	Dwyka Group	C-Pwe	Mudstone, siltstone, minor grit
Karoo Group	Swartrant Formation	Ps	Sandstone, gritstone, mudstone, coal
Karoo Group	Grootegeluk Formation	Pgr	Mudstone, carbonaceous shale, coal
Karoo Group	Eendragtpan Formation	TRe	Variegated shale
Karoo Group	Clarens Formation	TRc	Fine-grained cream-coloured sandstone
		Jl	Basalt

Figure 6.3: Geology of area (taken from the 1985 1:250 000 geological map)

Table 6.1 Geological formations in the region of the candidate sites

Formation/Group	Description
Clarens Formation	Argillaceous and arenaceous rocks
	Intergranular and fractured aquifers
	Borehole yields 0.1 - 0.5 l/s
Ecca Group (Grootegeluk)	Upper and middle Ecca
	Fractured aquifers
	Borehole yields 0.5 – 2.0 l/s
Ecca Group (Swartrant)	Lower Ecca
	Intergranular and fractured aquifers
	Borehole yields 0.5 – 2.0 l/s
Dwyka Group	Predominantly arenaceous rocks
	Fractured aquifers
	Borehole yields 0.5 – 2.0 l/s
Waterberg Group	Predominantly arenaceous rocks
	Fractured aquifers
	Borehole yields 0.5 – 2.0 l/s

(from Bohlweki Environmental, 2006)

Groundwater is generally under-utilised in the study area and DWAF (2004) has noted that the first option to supply increased requirements should be from groundwater, provided the water quantity and quality are acceptable for its intended use. There are no artesian boreholes located within the adjacent area and no large scale groundwater abstraction occurs in the study area currently (Bohlweki Environmental, 2006).

The groundwater potential of the geological formations located in the study area is limited in their pristine, unweathered state due to low permeability, storage and transmissivity. However, in their weathered, fractured state water is able to permeate the fractures and hence the formations' groundwater potential in these fractured transitional zones between weathered and unweathered crystalline Letaba basalt rocks, found in the study area, is good. Deeper fractures within the basalt, associated with faulting, also have good groundwater potential as the water collects within the fractures. Fractured fault zones, especially if related to tensional stress, are potentially productive targets for groundwater development. The graben structures[19] in the study area are associated with tensional stresses, thus the Eenzaamheid fault could be an area of increased groundwater potential. The Daarby thrust fault is impermeable (Bohlweki Environmental, 2006).

The proposed power station could have an impact on groundwater resources through contamination from various components of the power station, but most notably from the ash disposal facility, 'dirty water' dams and the WWTW. As described in **Section 4.3.4** above, the only ash disposal technology being considered for the proposed power station is above-ground ash disposal. Run-off from the ash disposal facility and leachate generated through infiltration of water have the potential to contaminate the groundwater resource.

[19] Typically a "rift" valley formed by the sinking of land between two roughly parallel faults.

It is therefore recommended that a groundwater impact assessment be undertaken to quantify the potential impacts on the groundwater resource and to recommend potential mitigation measures to minimise or eliminate the potential impacts. The ToR for the groundwater impact assessment are as follows:

- Undertake an initial site visit with the EIA team in order to obtain an overview of the candidate sites and to refine the ToR.
- Undertake a literature review and collect baseline data to establish the *status quo* of quality and quantity of groundwater resources at the candidate sites.
- Collect relevant data from existing boreholes on the candidate sites and report on the flow direction and pattern of groundwater in the area.
- Undertake an assessment of potential impacts of the proposed power station and associated infrastructure on the groundwater in terms of the scale of impact (local, regional, national), magnitude of impact (low, medium or high) and the duration of the impact (construction, up to 10 years after construction, more than 10 years after construction).
- Comment on the potential cumulative impacts of the second power station, as well as developments in the broader area (e.g. Sasol's proposed coal-to-liquids facility), on the groundwater.
- Assess the groundwater impacts of above-ground ash disposal, and comment on the implications of back ashing and in-pit ashing.
- Propose mitigation measures that could reduce, eliminate or prevent the occurrence of the identified impacts and comment on the effectiveness of these.
- Compile a groundwater monitoring plan for the operational phase of the project.

Groundwater Consulting Services (GCS), led by Andrew Johnstone has been appointed to undertake the groundwater impact assessment. Mr Johnstone has over 24 years experience as a hydrogeologist with key expertise in the exploration and design of wellfields and regional hydrogeological investigations and mapping. GCS has also been involved in determining the groundwater impacts of other similar coal-fired power stations in South Africa.

6.3 OPERATIONAL PHASE IMPACTS ON THE SOCIAL ENVIRONMENT

This section of the report describes the socio-economic environment and considers the long-term or operational phase impacts on the social environment that may be associated with the proposed activities, including the following:

- Visual impacts;
- Noise impacts;
- Impact on health of surrounding people;
- Risk assessment;
- Impact on heritage resources;
- Impact on local economy;
- Impact on land use and planning;

- Impact on livelihood security;
- Impact on tourism
- Impact on traffic and
- Impact on agricultural potential.

6.3.1 VISUAL IMPACTS

The study area in the vicinity of the candidate sites is located at some 940 metres above mean sea level (mamsl). The area is relatively flat, with a very gradual slope east to west towards the Matlabas River. The highest point in the immediate surrounds is 1 003 mamsl on Grootlaagte Farm (No. 354) immediately south of Leliefontein Farm (which forms part of Site A). The Waterberg foothills start rising to the east of Site A beyond the railway line.

The landscape is dominated by bushveld except where the Matimba Power Station can be seen, with the existing power station and stacks visible for many kilometres. The Matimba Power Station, Medupi Power Station (in the process of being constructed) and the Grootegeluk Mine are all located within 20 to 40 km of the candidate sites. Many transmission lines, including high voltage 400 kV lines also cross the landscape in places. Furthermore, new transmission lines are proposed in the area, between Botswana and the study area, and to the south of the study area. To the west of the candidate sites is a phosphate mine and mine dump which can be seen from the road DR1675. Land use on the three candidate sites is mainly game farming with some agriculture land and cattle farming. The natural vegetation is dominated by bushveld. See **Figure 6.4** to **Figure 6.11** for photographs of the surrounding area.

The proposed power station infrastructure would include the following (see **Figure 6.12**):

- Two flue gas stacks (should direct dry cooling be implemented) between 150 and 300 m high;
- The core power station building, likely to be 150 m wide and 500 m long;
- A total of six cooling towers (should indirect dry cooling be implemented), approximately 160 m high; and
- Other infrastructure such as a coal and sorbent stock pile, coal conveyors, ash conveyors, an ash handling facility (ash dump) and telecommunications facilities/mast.

As noted in **Section 4.3.4** above, if indirect dry cooling technology is selected by Eskom, cooling towers would be required for the cooling system. However, if direct dry cooling technology is implemented, the cooling towers are replaced with a bank of cooling fans. The candidate sites are quite flat and the ability of the natural vegetation to absorb the visual impact is low.

Figure 6.4 Windpump and reservoir along the DR1675

Figure 6.5 Natural pan (from the air)

Figure 6.6 Typical bushveld and grazing land (seen from the air)

Figure 6.7 Transmission lines crossing the bushveld (seen from the air)

Figure 6.8 Pump station and café at Steenbokpan

Figure 6.9 Informal housing at Steenbokpan

Figure 6.10 Typical bush veld characteristic of the area

Figure 6.11 Typical grazing land found in the area

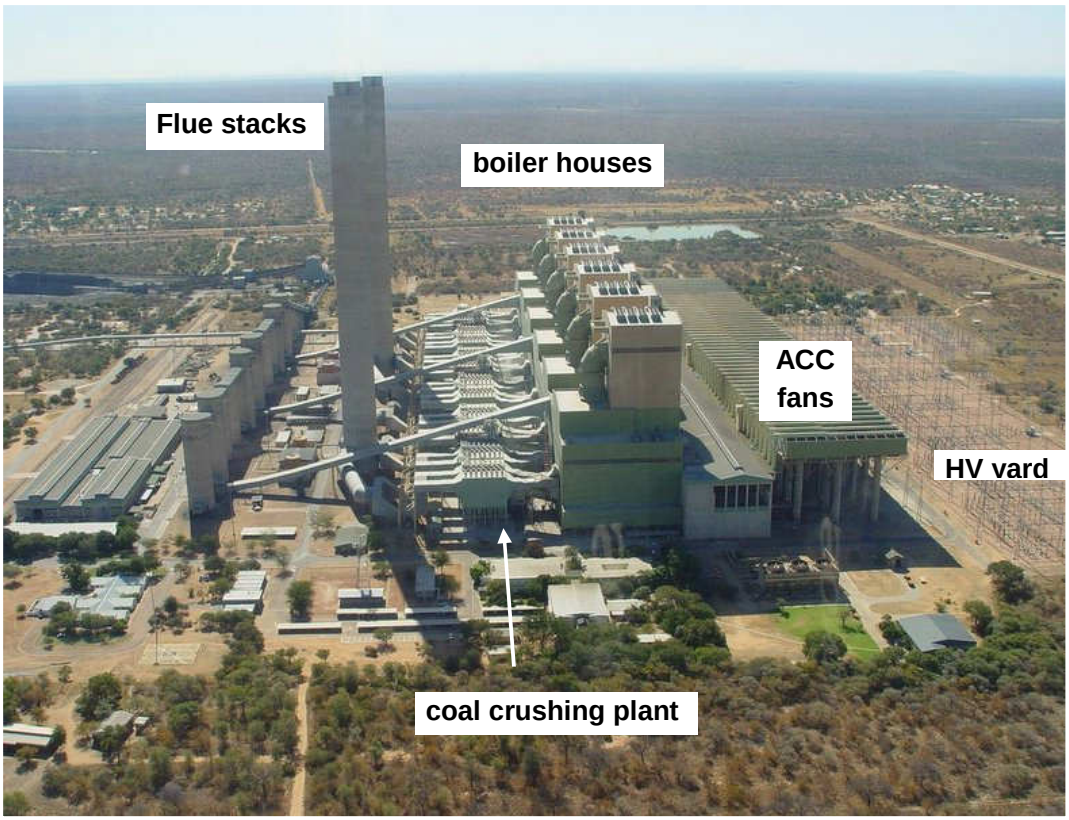


Figure 6.12 Photograph indicating typical power station components

Furthermore, there are many game farms in the area which are a tourist attraction. Consequently viewer incidence and perception is likely to vary across the study site and in the broader region.

In light of the above, it is recommended that a visual impact assessment (VIA) be undertaken as part of the EIA process. The ToR for the VIA are as follows:

- Undertake an initial site visit with the EIA team in order to obtain an overview of the candidate sites and to refine the ToR.
- Undertake a review of baseline information, describe the receiving environment; and establish a view catchment area, view corridors, view points, receptors and identification of potential lighting impacts at night,
- Undertake photomontage simulations for the sites for two operating scenarios, namely, one power station on each of the alternative sites and two power stations on combinations of two of the three candidate sites, demonstrating where applicable:
    - Views with and without mitigation;
    - Views under worst (least visible) and best (most visible) weather conditions; and
    - Views during night time.
- Undertake an assessment of the visual impacts at the three candidate sites, in terms of the scale of impact (local, regional, national), magnitude of impact (low, medium or high) and the duration of the impact (construction, up to 10 years after construction, more than 10 years after construction);

- Describe potential mitigation measures to reduce or eliminate the potential visual impacts identified.

Strategic Environmental Focus' landscape architecture unit has been appointed to undertake the VIA. The team will be led by Mr Eamonn O'Rourke, a Landscape Architect with over 14 years experience in the field. He has undertaken a suite of VIAs for a range of projects in the mining and industrial sector and for linear infrastructure developments, including transmission lines and power stations such as the Project Bravo and Project Golf power stations and the Kudu transmission and substation project.

6.3.2 NOISE IMPACTS

As mentioned above, the general terrain of the candidate sites is flat, falling gently to the west. Existing infrastructure which contributes to the ambient noise levels includes roads, the railway line and the existing Matimba power station, which uses direct dry cooling technology. Medupi power station, currently under construction, would also add to the future ambient noise. The roads running past the candidate sites include the DR1675 which passes west through Steenbokpan, and the DR175 which runs to the north through Steenbokpan and passes into Botswana at the Stockpoort border post. A railway line runs in a north-south direction, across the DR175 and terminates at the Matimba power station and the Grootegeluk mine. The existing power station conveyor belts for coal and ash, the ash spreading activities at the ash disposal facility and the WWTW may also contribute to ambient noise levels at the candidate sites. Furthermore, increased traffic volumes on the local roads due to the construction of the Medupi power station is also likely to be adding to the ambient noise levels of the area. Once the power station is operational, the ambient noise levels are likely to persist, with the large volumes of workers driving to work.

The significance of noise impacts is linked to the type of surrounding land use in the area, and can be divided into residential, industrial, mining and agriculture. The human settlement that is most likely to be sensitive to increased noise levels is Steenbokpan, located to the north of Site B and east of Site C. Current industrial and mining activities are located at least 20-40 km away from the candidate sites and from Steenbokpan. Agriculture (including game farming) is the dominant land use, with several farm houses and farm labourer houses spread over the candidate sites.

The proposed power station would be similar to the existing Matimba power station, in that it would include conveyors of up to 30 km in length to transport the coal to the power station, conveyors to transport the ash to the ash disposal facility located within close proximity to the power station, machinery to spread the ash at the ash disposal facility and a WWTW on the site. However, the main noise source at the proposed power station would be from the cooling fans, should Eskom choose to implement direct dry cooling technology. Matimba power station utilizes 48 fans per generating unit, and the Medupi power station currently being constructed would use 54 fans per generating unit. Since there are six generating units proposed for each of the power stations this would equate to more than 324 fans per power station, or a total of more than 648 fans for two power stations utilising direct dry cooling technology.

The proposed power station and its ancillary infrastructure is likely to increase the ambient noise levels in the region, which may have an impact on the surrounding land users such as the Steenbokpan settlement, especially if direct dry cooling technology is implemented. It is therefore recommended that a noise impact assessment be undertaken to determine the extent of the potential impact. The ToR for a noise impact assessment are as follows:

- Undertake the collection of baseline data from existing sources, through liaison with other specialist teams, and ground-truthing in order to determine:
    - Major noise sources in the vicinity of the candidate sites; and
    - Appropriate noise measurement locations.
- Establishing the ambient noise context in the region by means of a noise measurement survey, which will include:
    - Undertaking noise measurements in terms of SANS 10103:2003, "The measurement and rating of environmental noise with respect to land use, health, annoyance and speech communication";
    - Assessing and recording the qualitative nature of the noise climate i.e. to ensure a correlation between noise perceived by the human ear and noise measured by instruments.
- Assessing the potential noise impacts of the proposed power station on the ambient noise levels at the candidate sites. This will include:
    - Identifying potential noise impacts associated with the construction and operational phases of the proposed power stations;
    - Assessing the impacts of two operating scenarios and evaluating the effect on the change in the noise climate in terms of the scale of impact (local, regional, national), magnitude of impact (low, medium or high) and the duration of the impact (construction, up to 10 years after construction, more than 10 years after construction). The operating scenarios comprise (1) a single power station on each of the alternative sites and (2) two power stations on combinations of two of the three candidate sites.
- Identify mitigation measure to minimise or eliminate predicted impacts on noise receptors. This will include providing input into the construction and operational phase EMP to be developed for the project.

Mr Derek Cosijn of Jongens, Keet and Associates has been appointed to undertake a noise impact assessment. Mr Cosijn has over 40 years of experience over a wide range of civil engineering, transportation planning, environmental and acoustic engineering projects. Some of the approximately 110 environmental and noise impact projects with which he has been involved with over the last 10 years include Gautrain Noise Impact Study, Tutuka Power Station Coal Supply Railway Noise Impact Assessment, Majuba Power Station Coal Supply Railway Noise Impact Assessment, Medupi Power Station Noise Impact Assessment and the Olifants River Water Resources Development Project Noise Impact Assessment.

6.3.3 IMPACT ON HEALTH OF SURROUNDING PEOPLE

The establishment of the two proposed power stations is likely to result in a range of emissions including SO_x, NO_x, CO_2 gases as well as particulate matter being emitted into the atmosphere. In terms of human health, SO_2 emissions and heavy metals are part of the concern and the

threshold concentrations of these pollutants are controlled by a suite of South African and international air quality legislation and standards.

SO_2 is damaging to human respiratory functioning, increasing both the prevalence of chronic respiratory disease, and the risk of acute respiratory disease. Being highly soluble, SO_2 is more likely to be absorbed in the upper airways rather than penetrate to the pulmonary region. Exposure to heavy metals such as lead and mercury are of particular concern as these can cause nervous system disorders, respiratory problems and even cause cancer. Oxides of nitrogen are particularly harmful to children and can lead to respiratory diseases.

The production of SO_2, NO_x and particulate matter arising out of the burning of fossil fuels as would be the case at the proposed coal-fired power stations, would contribute to the ambient levels of the above-mentioned compounds.

It is therefore recommended that a detailed air quality impact assessment be undertaken to establish the ambient air quality levels, to predict what impact the proposed power stations would have on the ambient levels, and to determine whether or not the proposed atmospheric emission abatement technologies would be able to meet the South African and international air quality standards (see **Section 4.3.4** above). The ToR for this study are outlined in **Section 6.2.3** above.

6.3.4 SOCIETAL RISK

The proposed power stations would 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. The handling, transportation and storage of this material is covered by a range of legislation, including the Occupational Health and Safety Act (No. 85 of 1993), the Major Hazardous Installation Regulations (July 2001), and the Road Transportation Act (No 74 of 1977). Given the requirement for hazardous material to be stored on site during the operational phases of the project, the determination of the risk to employees and surrounding landowners at a preliminary level[20] is recommended. The ToR would be as follows:

- Undertake an initial site visit with the EIA team in order to obtain an overview of the candidate sites and to refine the ToR.
- Undertake a preliminary risk assessment to
    - review the scope of the project;
    - list hazardous materials that would be associated with the operation of the power station;
    - Provide a general process description;
    - Describe possible major incidents associated with this type of installation and the consequences of such incidents (including potential incidents);
    - Provide an estimate of the probability of a major incident;

[20] A Major Hazard Installation assessment is likely to be required at a later point in terms of the Occupation Health and Safety Act.

  - Provide a rough estimate of the consequences under "worst case" scenario for on-site workers health as well as the consequences of causing an offsite incident for one power station on each of the alternative sites and two power stations on combinations of two of the three candidate sites
  - Describe the potential effect of a major incident on any other installation, members of the public (including all persons outside the premises) and on residential areas; and
  - Describe any requirements in terms of NEMA,
- Compile an assessment of the risks associated with the proposed power stations (for the scenarios of one and two power stations), in terms of the scale of impact (local, regional, national), magnitude of impact (low, medium or high) and the duration of the impact (construction, up to 10 years after construction, more than 10 years after construction).
- Describe mitigation measures that could reduce or eliminate the risks.

Mr Mike Oberholzer from Riscom (Pty) Ltd. has been appointed to undertake the preliminary risk assessment. Mr Oberholzer has undertaken a suite of risk assessments and Riscom is one of few companies that is an Approved Inspection Authority for Major Hazard Installations in South Africa. Mr Oberholzer has over 20 years experience in all aspects of project implementation. Since 2001, Mike has concentrated on risk studies in various industries including offshore assignments in the oil and gas, chemical, petrochemical, agrochemicals, mining and food industries.

6.3.5 IMPACT ON HERITAGE RESOURCES

Heritage resources include archaeological material (e.g. rock paintings, stone tools), palaeontological material (e.g. fossilised materials) and cultural heritage material (e.g. old graveyards, fences or ruins of buildings). Since some potential heritage material is buried, it is often only found during the construction phase of a project.

A previous heritage study (PDA & Margen, 2007) undertaken in the general area of the candidate sites for transmission lines found the following heritage material:

- Limited stone tool occurrences;
- Engravings on a kopjie, Nelsonskop;
- A number of historical houses and other historical remains;
- The historical Steenbokpan rural village (townscape) that incorporates shops, residences and graveyards that are older than sixty years; and
- A number of graves. Some of the graveyards were historical in nature.

The stone tools and historical houses were considered to have low to medium heritage significance, while the engravings, Steenbokpan townscape and the graves and graveyards were considered to have high heritage significance (PDA & Margen, 2007).

A second heritage study (Bohlweki Environmental, 2006) undertaken in the general area of the candidate sites for Medupi power station also found graves, as well as small pieces of Iron Age

and stone tools. The sites of the findings were not considered to be of heritage significance although it was recommended that all the graves be avoided.

A large scale development such as the proposed coal-fired power station and ancillary infrastructure can have a negative impact on archaeological and cultural heritage resources by damaging or destroying such material, by requiring the material to be removed and stored *ex-situ* or by making sites more easily accessible to the general public and therefore prone to vandalism or destruction. It is therefore essential that the potential impacts of any development be assessed at the earliest possible phase of project planning, in order to determine the best course of action for heritage resources found on site. Furthermore, it is important to include mitigation measures in a construction phase Environmental Management Plan to provide guidance to contractors in the event that archaeological or palaeontological material is found on site during the construction phase. It is therefore recommended that a Phase 1 Archaeological Assessment be undertaken. The ToR for the assessment are as follows:

- Undertake an initial site visit with the EIA team in order to obtain an overview of the candidate sites and to refine the ToR.
- Undertake a Phase 1 archaeological assessment of the candidate sites in accordance with the requirements of Section 38(3) of the NHRA, which would include:
    - Conducting a detailed desk-top level investigation to identify all archaeological, cultural and historic sites in the area;
    - Undertake field work to verify results of desktop investigation;
    - Document (GPS coordinates and map) all sites, objects and structures identified on the candidate sites.
- Compile a report which would include:
    - Identification of archaeological, cultural and historic sites within the proposed development areas;
    - Evaluation of the potential impacts of construction, operation and maintenance of the proposed development on archaeological, cultural and historical resources, in terms of the scale of impact (local, regional, national), magnitude of impact (low, medium or high) and the duration of the impact (construction, up to 10 years after construction, more than 10 years after construction);
    - Comment on the impacts of two power stations, as well as other developments in the broader area (e.g. Sasol's proposed coal-to-liquids facility);
    - Recommendation of mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural or historical importance;
    - The preparation of a heritage resources management plan which includes recommendations on the management of the objects, sites or features, and also guidelines on procedures to be implemented if previously unidentified cultural resources are uncovered during later developments in the area.

Dr Johnny van Schalkwyk, a private heritage consultant, has been appointed to undertake the requisite heritage impact assessment. Dr van Schalkwyk has undertaken over 800 archaeological, anthropological and social impact assessments, including the assessments of two power station projects in the Northern Free State and Mpumalanga and has worked in the Waterberg area previously (most notably on the Medupi power station project). Other projects assessed include powerlines, roads, pipelines, dams, mine developments, water purification works, historical landscapes, refuse dumps and urban developments.

6.3.6 IMPACT ON LOCAL ECONOMY

The three candidate sites are located within the Waterberg District Municipality, and in the Lephalale Local Municipality (LM). According to the Lephalale LM IDP, the Lephalale municipal economy is dominated by the electricity/water sector and specifically by power generation, which is represented by the Matimba Power Station. This sector is responsible for 72.5 % of the value of production in the municipality, which reflects a low level of diversification and a high level of vulnerability (Lephalale LM, 2007).

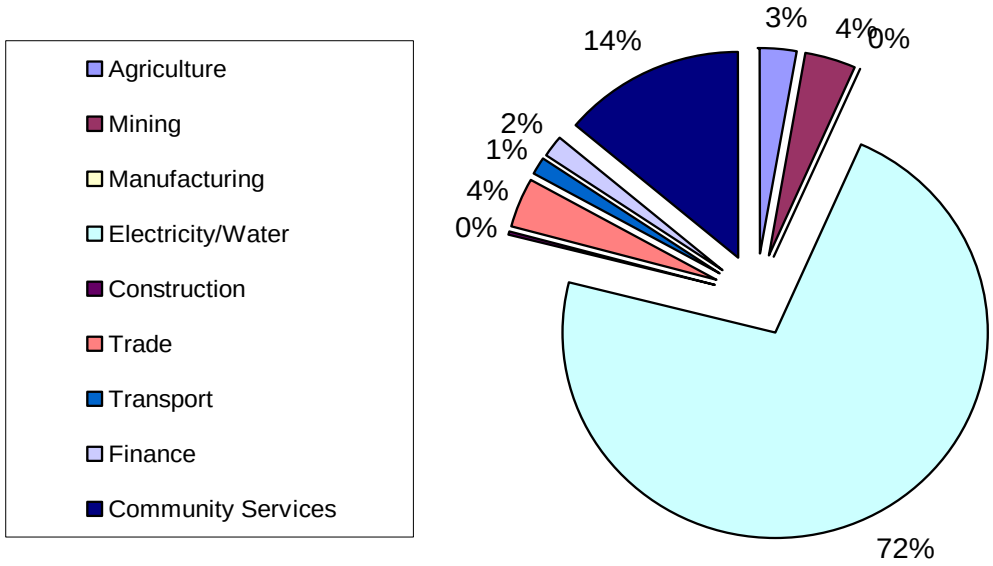


Figure 6.13: Contributions of all sectors to the Lephalale local economy
(from Lephalale LM, 2007)

Agriculture is the fifth biggest contributor to the municipal economy, but it appears to be in decline. The average compounded economic growth rate for the period 1995 to 2000 was 6.5 %, which is below the inflation rate for the same period. It implies that the municipal economy has declined in real terms over this period (Lephalale LM, 2007).

The economically active section of the population consists of 84.5 % employed and 15.5 % unemployed persons (Lephalale LM, 2007). This unemployment rate is well below the South African average of 23.1 % unemployed (in the second quarter of 2008)[21].

The occupation structure of the employed persons shows that the majority of employed people are concentrated in elementary occupations (48 %) with the second major occupation category being skilled agricultural workers (13 %).

The establishment of two additional power stations in the Lephalale area is likely to result in the injection of billions of Rands into the local economy directly and further capital indirectly. During the construction phase of a project of this nature, approximately 8 000 people at the height of construction would be employed across a range of skills from unskilled labourers, to semi-

[21] http://www.statssa.gov.za/keyindicators/keyindicators.asp

skilled and skilled professionals. Eskom's policy dictates that they would attempt to source the labour locally from the surrounding settlements, and would specify a local labour target for the successful contractor(s). The operational phase of the power station would result in the creation of some 600 permanent employment opportunities. Eskom may establish a settlement for these employees and as such this could create further opportunities for the generation of income in the region. Further to the above, a new coal mine would be required to provide a dedicated source of coal to the power station. This development would result in further job creation and investment of capital in the region.

An influx of people to the region and an increase in employment levels is also likely to result in an increase in disposable income and spending patterns, with a potential positive impact for local businesses.

However, in light of the above, the establishment of the power stations would also result in the loss of agricultural land and is likely to impact on the livelihood security of the farmers and farm workers that are displaced through the land negotiation and acquisition processes. Since agriculture in this area only contributes some 3 % to the GGP of the region, the loss in agricultural land would not be of great significance to the local economy. This impact is however discussed in detail in **Section 6.3.6**.

Given the wide array of potential economic spin-offs and potential financial difficulties for local farmers, it is recommended that a socio-economic assessment be undertaken as part of the EIA process to address, amongst other things, the potential impacts identified above. The ToR for this study are as follows:

- Undertake an initial site visit with the EIA team in order to obtain an overview of the candidate sites and to refine the ToR.
- Collect relevant data to establish baseline socio-economic/ economic conditions of the region, as input data for the regional Social Accounting Matrix (SAM) for the Limpopo Province, including:
    - Engagement with the Social specialist, the Agricultural Potential specialist, the Public Participation facilitator and Eskom in order to gather relevant baseline information;
    - Identifying up- and down-stream activities that may be influenced by the proposed power station;
    - Undertake socio-economic and economic profiling of the candidate sites;
- Run the regional Impact Assessment Model (based on the SAM) for the Waterberg region in order to quantify:
    - Direct and indirect impacts;
    - Induced impacts;
    - Cumulative impacts (additive, synergistic, time crowding and space crowding);
    - Duration of impacts;
    - Separate Construction (CAPEX Phase) and Operational (OPEX Phase) impact assessments;
- Compile an assessment of the potential impacts associated with the proposed project, in terms of the scale of impact (local, regional, national), magnitude of impact (low, medium or high) and the duration of the impact (construction, up to 10 years after construction, more than 10 years after construction). This assessment must include the cumulative

impacts of two power stations built in consecutive phases.

- Develop socio-economic and economic management plans, which will include:
  - Mitigation measures to reduce or eliminate predicted negative impacts;
  - Measures to enhance predicted positive impacts;
  - Provide practical, realistic implementation guidelines; and
  - Possible targets and action plans in support of the implementation guidelines.

Urban Econ, led by Mr Ben van der Merwe, has been appointed to undertake the socio-economic assessment. He has over 25 years experience as a Development Economist and has undertaken many similar assessments. Mr van der Merwe has developed and implemented innovative economic impact modelling techniques to quantify economic development indicators for capital expenditure projects. His skills have been applied in numerous local economic development and database development studies.

6.3.7 IMPACT ON LAND USE AND PLANNING

As mentioned in the section above, the three candidate sites are located with the Waterberg District Municipality and more specifically within the Lephalale LM. The land within the three candidate sites is currently owned by private individuals and in some cases family trusts or companies, with the majority of the land being under agriculture (either dry land agriculture, grazing or game farming). The total estimated number of residents in the Lephalale Municipality is approximately 104 144 (Lephalale LM, 2007). However it is estimated that no more than 30 landowners spread over the three candidate sites would be potentially directly affected by the proposed development.

The Lephalale Municipality SDF (2006) indicates that the land within the three candidate sites is privately owned consisting of game farms and small areas of cultivated land, as noted above. It also indicates that the candidate sites and Steenbokpan are located on top of coal fields, which happen to be deep coal reserves. This is in conflict with the geological information (see **Figure** 6.3) which indicates that there is no coal in this area. Steenbokpan is designated as a local service point for the area, with a secondary school less than 3 km north east of Steenbokpan and a primary school approximately 8 km to the south on the Doornlaagte farm.

The SDF indicates in its forward planning that Steenbokpan is designated as a future growth point. Lephalale and the area of the existing power station and Grootegeluk mine are designated as a development node. A marula fruit production project has been identified as a local economic development project situated within the Steenbokpan Service Point.

According to the IDP 180 electrical connections are required for Steenbokpan and approximately 150 houses are still needed for farm workers even though 150 houses were built by 2005 (Urban-Econ, 2007).

Development opportunities outlined in the Waterberg District Municipality: Local Economic Development Strategy (Urban-Econ, 2007) include:

- Creating an enabling environment where the electricity sector can become a hub within the provincial and national economy.

- Using the primary resources to create an opportunity for tourism development in the Lephalale region.
- Supporting by creative and sustainable developments as it is an important sector within the Lephalale economy.
- Developing small, micro and medium enterprises to integrate the agricultural and mining sectors with tourism developments.
- Adding value to the raw materials. The manufacturing of products that use the raw materials mined at Lephalale should be a core development objective.

The establishment of the two proposed power stations will require some 5 000 ha of land each, which is currently predominantly used for agriculture. The proposed power stations would therefore deviate from the proposed land use patterns identified in the SDF. In order to confirm the current planning and land use in the area, and to determine what further authorisations and actions would be required to obtain the requisite land use planning approvals, a specialist land use planning study is recommended. The ToR for the study are as follows:

- Undertake an initial site visit with the EIA team in order to obtain an overview of the candidate sites and to refine the ToR.
- Assessment of policies and proposals contained in the relevant Municipal Integrated Development Plans and Spatial Development Frameworks and their relevance to and impact on the proposed power station.
- Assessment of development proposals (e.g. the proposed Sasol coal-to-liquids facility and township), policies and township/ rezoning applications currently approved or being processing, within the study area.
- Assessment of any land claims made against the candidate sites.
- Comment on exploration and mineral rights for the candidate sites.
- Determining what land use rights are required from the relevant local and district Municipalities in respect of zoning and Town Planning Schemes and providing guidance on the requisite planning processes that would need to be undertaken by Eskom.

Mr Wim Jacobsz of Winterbach Potgieter & Partners Town and Regional Planners has been appointed to undertake this study. Winterbach Potgieter & Partners has extensive experience in town planning and has undertaken numerous studies in the Waterberg area.

6.3.8 IMPACT ON LIVELIHOOD SECURITY

Agricultural activities are by far the predominant land use in the area, and include cattle and game farming as well as some dry land agriculture. Many of the farms have been owned for many generations by the same family, and many farmers in the area own a suite of farms which are not always contiguous. As mentioned above, agriculture contributes some 3 % to the Lephalale Municipal economy.

As Eskom does not currently own any of the land it requires within the three candidate sites, it would have to purchase this land from the current owners, most of whom are farmers. The loss of land for farmers may have an impact on the security of many farmers' livelihoods. Eskom would compensate farmers at market values as well as for financial losses which should allow

them to re-establish their activities elsewhere. It may however, be challenging for farm workers to find alternative employment due to lack of skills.

The socio-economic assessment outlined in **Section 6.3.6** above would partially address the potential impacts on livelihood security. It is recommended that a comprehensive social impact assessment (SIA) also be undertaken to further address the impacts on livelihood security. The ToR for the SIA are as follows:

- Undertake an initial site visit with the EIA team in order to obtain an overview of the candidate sites and to refine the ToR.
- Collect data from a variety of sources, including, *inter alia*, key stakeholders interviews; site visit(s); project team; documentation on similar studies, census figures and statistics and spatial planning documents.
- Identify and assess potential impacts that could occur. The assessment will concentrate on the following impact categories:
    - Settlement Patterns;
    - Land Use Patterns (particularly agricultural and industrial);
    - Land ownership and use;
    - Comment on individuals and families potentially impacted;
    - Existing social infrastructure and social institutional frameworks and patterns;
    - Traversing Patterns;
    - Community and social dynamics; and
    - Any other relevant categories to be identified during the course of the study.
- Recommend mitigation measures to reduce the impacts, where necessary.
- Comment on the impacts of two power stations, as well as other developments in the broader area (e.g. Sasol's proposed coal-to-liquids facility);

Ms Ilse Aucamp of Ptersa Environmental Management Consultants would undertake the SIA. Ms Aucamp is the Director of Ptersa Environmental Management Consultants and has been involved in the social environment for over 13 years. Ms Aucamp has compiled numerous SIAs for various industries, including bulk water supply projects, smelters and resorts.

6.3.9 IMPACT ON TOURISM

The malaria-free Waterberg region is a tourism destination, attracting both international and local tourist. The bushveld game farms of the Lephalale area include the "Big Five" game and are marketed as ecotourism and trophy hunting destinations. Fishing opportunities are offered at the Mokolo dam to the south east of the candidate sites, while there is hiking, picnicking and bird watching in D'Nyala Nature Reserve. Festivals held annually in the area include the Bushveld Festival and the Marula Amateur Golf Tournament and the Ellisras Fire Arms Festival (www.lephalale.com).

The two proposed power stations would be located within the bushveld area approximately 48 km and 50 km from Lephalale and the Mokolo Dam, respectively. Potential visual and noise impacts, and potential impacts on human health may discourage people from visiting the area, which would have an impact on tourism for the Waterberg region.

Potential impacts on tourism are dealt with in the socio-economic assessment, outlined in **Section 6.3.6** above. Furthermore, the social ramifications would be addressed in the social impact assessment, as described in **Section 6.3.8** above.

6.3.10 IMPACT ON TRAFFIC

The proposed project is likely to result in an increase in traffic volumes within the region, during the construction and operational phases of the project. Road upgrades may therefore be required to the existing road network. It is therefore recommended that a traffic assessment be undertaken, the ToR as follows:

- Undertake an initial site visit with the EIA team in order to obtain an overview of the candidate sites and to refine the ToR.
- Collection of background information and undertake traffic counts at each of the sites to establish a baseline and peaks of traffic in the area.
- Superimpose the generated traffic on the current and future road and traffic system and determine the current operating Levels of Service of the affected roads. Assess how these would be impacted by only one power station as well as by two power stations.
- Analyse the temporary as well as long term effects of access roads, loading and storage and commuting.
- Comment on access configurations, site layout and circulation, freight and public transport facilities, control and road infrastructure improvements.
- Discuss the outcomes of the study with the relevant road authorities, where required.
- Propose mitigation measures, where necessary, to mitigate the assessed impacts and for inclusion in an EMP.

Mr Louis Roodt of Ndodana Consulting Engineers, a transportation engineer with over 32 years experience in the transport sector would undertake this study. Mr Roodt has undertaken a number of Traffic Impact Assessments for various projects including shopping malls, municipal transport plans, industry and township establishment and rezoning applications.

6.3.11 IMPACT ON AGRICULTURAL POTENTIAL

As mentioned above, the loss of agricultural land is likely to be significant for individual landowners and their workers, due to the potential impact that the project could have from a livelihood security perspective. While the economic issues are being addressed through the socio-economic assessment, it is recommended that an agricultural potential assessment be undertaken to determine the agricultural potential of the candidate sites, and the impact of the subsequent loss of land. The ToR for the study are as follows:

- Undertake an initial site visit with the EIA team in order to obtain an overview of the candidate sites and to refine the ToR.
- Undertake a literature review and collection of baseline data, to establish the *status quo* of agricultural resources within the study area and at the candidate sites (detailed grids will not be undertaken).

- Undertake fieldwork to gather additional data and to determine the soil potential of the candidate sites and describe the soil characteristics, both physical and chemical.
- Determine the land capability and landuse of the candidate sites.
- Undertake an assessment to predict the potential impacts on agricultural potential at the three candidate sites, in terms of the scale of impact (local, regional, national), magnitude of impact (low, medium or high) and the duration of the impact (construction, up to 10 years after construction, more than 10 years after construction);
- Comment on the cumulative impacts of the two power stations, as well as developments in the broader area (e.g. Sasol's proposed coal-to-liquid facilty), on the agricultural potential.
- Propose mitigation measures that could reduce or eliminate the identified impacts.

Ms Alta van Dyk would undertake this study. She is the Managing Director of Ivuzi Environmental Consultants and has over 15 years experience in the environmental field focusing on impact assessments, water and waste aspects, remediation initiatives and legislative compliance. Ms van Dyke is registered with the South African Council for Natural Scientific Professions.

6.4 CONSTRUCTION PHASE IMPACTS ON THE BIOPHYSICAL AND SOCIAL ENVIRONMENTS

The construction phase is likely to result in a number of negative impacts on the biophysical and the social environment. These could potentially include:

- Disturbance of flora and fauna;
- Sedimentation and erosion of water ways;
- Increase in traffic volumes;
- Interruption of road and rail services;
- Storage of hazardous substances on site;
- Increased risk of fire;
- Security risks;
- Health issues;
- Noise pollution;
- Light pollution; and
- Dust impact.

The significance of construction phase impacts is likely to be limited by their relatively short duration, since the construction phase should last approximately nine years per power station. There is the possibility that construction of the second power station could commence while the first power station is still being constructed, magnifying the construction related impacts for a shorter period. Many of the construction phase impacts could be mitigated through the implementation of an appropriate EMP. During the EIR phase, the construction phase impacts on the biophysical and socio-economic environment will be assessed, in terms of the methodology outlined in the Plan of Study for EIR (see **Chapter 7**). Furthermore, a framework

EMP will be compiled as part of the EIA process, and submitted as part of the EIR, to provide mitigation and ascribe responsibilities for many of the construction phase impacts.

6.4.1 DISTURBANCE OF FLORA AND FAUNA

This impact considers impacts beyond the permanent footprint impacts of the proposed power station. Alien plant seeds could be introduced with construction material such as sand or other materials, with any disturbed areas being particularly vulnerable.

As outlined above, the affected fauna are largely mobile and would relocate during the construction phase and are likely to recolonise the area once the construction phase has been completed and the disturbed areas rehabilitated.

6.4.2 SEDIMENTATION AND EROSION

The sediment loads of any drainage depressions and wetlands or pans may increase due to the major excavations on the site, the laying of linear infrastructure across drainage lines and other construction related activities. This would be exacerbated during the wet season and during intense rainfall events.

6.4.3 INCREASE IN TRAFFIC VOLUMES

Construction vehicles are likely to make use of the existing roads, including the DR175 and DR1675 to transport equipment and material to the construction site. Furthermore, the construction site is likely to operate on a 24-hour basis at times. Construction related traffic could impact negatively on the traffic flow in the vicinity and on the integrity of the affected roads. Furthermore, this may exacerbate the risk of vehicular accidents, especially at night.

6.4.4 INTERRUPTION OF ROAD AND RAIL SERVICES

Traffic flows on the main roads may be partially interrupted if new access routes are required and also during the construction of the coal conveyors and pipelines at the points where they cross major roads or the railway line.

6.4.5 STORAGE OF HAZARDOUS SUBSTANCES ON SITE

As at any construction site, various hazardous substances are likely to be used and stored on site. These substances include amongst other things, diesel, curing compounds, shutter oil and cement. Utilisation of such substances in close proximity to the aquatic environment such as wetlands or pans is of greater concern than when used in a terrestrial environment.

Use of hazardous substances at a construction site is controlled by various pieces of legislation. The management and protection of the environment would however be achieved through the implementation of an EMP, which would *inter alia* specify the storage details of hazardous compounds and the emergency procedures to follow in the event of a spillage.

6.4.6 INCREASED RISK OF FIRE

Temperatures in the Waterberg can rise to 40ºC in summer. Furthermore, the bushveld vegetation is prone to fires being started by lightning strikes in summer. Construction activities onsite may increase the risk of fire in the area in both the wet summer months and the dry winter months. The outbreak of fire at the construction site could have serious safety, economic and ecological implications. The risk of fire would be managed through the EMP, which would include procedures for dealing with emergency situations such as fires.

6.4.7 SECURITY RISKS

As mentioned above, during the construction phase some 8 000 people are likely to be employed, with the numbers rising and falling throughout the construction period, dependent on the activities taking place at the time. While Eskom would want to source construction labour locally, it is inevitable that there will be an influx of people to the area. The increase in people to the area, as well as the periods where some construction workers are unemployed could lead to an increase in crime and violence in Lephalale, Steenbokpan, Onverwacht, Marapong and the surrounding areas.

6.4.8 HEALTH ISSUES

The migration of construction workers into the Lephalale region could result in an increase in the prevalence of diseases in the area including *inter alia* HIV/AIDS and tuberculosis. Health risks could be increased by an influx of sex workers to the area, fed by a large number of construction workers who are away from their families. Medical facilities in the area may not be equipped to deal with the increased requirement for healthcare as a result of the construction activities.

6.4.9 NOISE POLLUTION

As mentioned above, the construction site is likely to operate 24-hours a day, for a portion of the construction period. An increase in noise pollution would be expected from the operation of heavy machinery during the construction period, as well as due to the increased traffic. The severity of this impact is likely to be reduced due to the low numbers of people in close proximity to the candidate sites.

6.4.10 LIGHT POLLUTION

Large floodlights are likely to be installed at the construction site to enable construction activities to continue 24 hours per day, when required. The relatively low numbers of people in close proximity to the candidate sites is likely to reduce the severity of this impact.

As mentioned, many of the construction phase impacts could be managed or mitigated through the implementation of an appropriate enforceable EMP. A framework EMP will be compiled as part of this EIA process and will be contained in the EIR.

6.4.11 DUST IMPACTS

Construction vehicles are likely to make use of the existing roads, including the DR175 and DR1675 to transport equipment and material to the construction site. Furthermore, the construction site is likely to operate on a 24-hour basis at times and large earthworks would be undertaken. These activities would exacerbate dust especially in the dry winter months. The dust impact would be managed through the EMP, which would include procedures for dealing with dust pollution events including watering of roads, etc.

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7 PLAN OF STUDY FOR EIA

The purpose of this chapter is to detail the Plan of Study for the EIA Phase to ensure that this EIA process satisfies the requirements of NEMA

7.1 PURPOSE OF THIS PLAN OF STUDY FOR EIA

The Scoping process has been documented in this Scoping Report, which has identified various potential environmental impacts and project alternatives that require detailed investigation. This Plan of Study is the culmination of the Scoping Phase and its purpose is to ensure that the EIA phase of this EIA process satisfies the requirements of NEMA. Accordingly, this Plan of Study for EIA outlines the anticipated process and products for the EIA phase.

This Plan of Study for EIA has been compiled in terms of Government Notice No R.385 of 21 April 2006 of NEMA and will be submitted to DEAT for their consideration.

7.2 DESCRIPTION OF THE ACTIVITY

The nature of the activity is described in detail in **Chapter 4**, but in brief includes the following:

- Construction of two coal-fired power stations with six boiler/ turbine sets with a nominal electricity generation capacity of approximately 5 400 MW (900 MW per unit[22]) each.

Associated infrastructure that would also be established includes the following:

- Coal and sorbent stock yard;
- Coal, ash, sorbent and gypsum conveyors;
- A HV yard within the power station precinct;
- Water and wastewater treatment facilities;
- Ash and spent sorbent disposal systems and dump site;
- Gypsum storage facility
- Access roads;
- Maintenance, medical, administration, services, control buildings;
- Water supply for construction phase;
- Raw water pipeline and reservoirs;
- Dams for storage of “clean” and “dirty” water;
- Railway lines and sidings for sorbent supply;
- Transmission lines (to the proposed Delta substation and to be deviated within sites);
- Power supply for the construction phase (substation, transmission and distribution lines);

[22] The station capacity rating is dependant on the selected technology based on various Original Equipment Manufacturer (OEM) proposals, which would be acquired during the technical and commercial evaluation process.

- Borrow pits (on site);
- Communication mast/telecommunication facilities;
- General and hazardous storage and handling facilities;
- Batching plant (including concrete and asphalt); and
- Construction worker accommodation.

7.3 DESCRIPTION OF TASKS TO BE PERFORMED

7.3.1 POTENTIAL ENVIRONMENTAL IMPACTS IDENTIFIED DURING SCOPING

Chapter 6 has reviewed the range potential environmental impacts associated with the proposed establishment of a coal-fired power station and associated infrastructure in the Waterberg. Pursuant to this assessment, which was based on literature, input from the authorities, interested and affected parties (I&APs) and various specialists, a shortlist of potentially significant environmental impacts were identified for further, more detailed investigation during the EIR phase. Specifically the following potential environmental impacts have been identified:

- Operational phase impacts on the biophysical environment:
    - Impact on the terrestrial fauna and flora;
    - Impact on aquatic flora and fauna, inclusive of wetlands;
    - Impact on ambient air quality;
    - Impact of founding conditions on the power stations; and
    - Impact on groundwater resources.
- Operational phase impacts on the social environment:
    - Visual impacts;
    - Noise impacts;
    - Impact on health of surrounding landowners;
    - Societal risk;
    - Impact on heritage resources;
    - Impact on local economy;
    - Impact on land use and planning;
    - Impact on livelihood security;
    - Impact on tourism;
    - Impact on traffic; and
    - Impact on agricultural potential.
- Construction phase impacts on the biophysical and social environments:
    - Disturbance of flora and fauna;
    - Sedimentation and erosion of water ways;
    - Increase in traffic volumes;
    - Interruption of road and rail services;
    - Storage of hazardous substances on site;
    - Increased risk of fire;
    - Security risks;
    - Health issues;
    - Noise pollution;

- Light pollution; and
- Dust impact.

7.3.2 METHOD OF ASSESSING THE SIGNIFICANCE OF POTENTIAL ENVIRONMENTAL IMPACTS

This section outlines the proposed method for assessing the significance of the potential environmental impacts outlined above. As indicated, these include both operational and construction phase impacts.

For each impact, the EXTENT (spatial scale), MAGNITUDE and DURATION (time scale) would be described. These criteria would be used to ascertain the SIGNIFICANCE of the impact, firstly in the case of no mitigation and then with the most effective mitigation measure(s) in place. The mitigation described in the EIR would represent the full range of plausible and pragmatic measures but does not necessarily imply that they would be implemented.[23]

The tables on the following pages show the scale used to assess these variables, and defines each of the rating categories.

Table 7.1 Assessment criteria for the evaluation of impacts

CRITERIA	CATEGORY	DESCRIPTION
Extent or spatial influence of impact	**Regional**	Beyond a 30 km radius of the candidate site.
	Local	Within a 30 km radius of the candidate site.
	Site specific	On site or within 100 m of the candidate site.
Magnitude of impact (at the indicated spatial scale)	**High**	Natural and/ or social functions and/ or processes are *severely* altered
	Medium	Natural and/ or social functions and/ or processes are *notably* altered
	Low	Natural and/ or social functions and/ or processes are *slightly* altered
	Very Low	Natural and/ or social functions and/ or processes are *negligibly* altered
	Zero	Natural and/ or social functions and/ or processes remain *unaltered*
Duration of impact	**Construction period**	Up to 10 years
	Medium Term	Up to 10 years after construction
	Long Term	More than 10 years after construction

The SIGNIFICANCE of an impact is derived by taking into account the temporal and spatial scales and magnitude. The means of arriving at the different significance ratings is explained in **Table 7.2**.

[23] The applicant will be requested to indicate at the Draft EIR stage which alternative and mitigation measures they are prepared to implement.

Table 7.2 Definition of significance ratings

SIGNIFICANCE RATINGS	LEVEL OF CRITERIA REQUIRED
High	• High magnitude with a regional extent and long term duration • High magnitude with either a regional extent and medium term duration or a local extent and long term duration • Medium magnitude with a regional extent and long term duration
Medium	• High magnitude with a local extent and medium term duration • High magnitude with a regional extent and construction period or a site specific extent and long term duration • High magnitude with either a local extent and construction period duration or a site specific extent and medium term duration • Medium magnitude with any combination of extent and duration except site specific and construction period or regional and long term • Low magnitude with a regional extent and long term duration
Low	• High magnitude with a site specific extent and construction period duration • Medium magnitude with a site specific extent and construction period duration • Low magnitude with any combination of extent and duration except site specific and construction period or regional and long term • Very low magnitude with a regional extent and long term duration
Very low	• Low magnitude with a site specific extent and construction period duration • Very low magnitude with any combination of extent and duration except regional and long term
Neutral	• Zero magnitude with any combination of extent and duration

Once the significance of an impact has been determined, the PROBABILITY of this impact occurring as well as the CONFIDENCE in the assessment of the impact, would be determined using the rating systems outlined in **Table 7.3** and **Table 7.4** respectively. It is important to note that the significance of an impact should always be considered in concert with the probability of that impact occurring. Lastly, the REVERSIBILITY of the impact is estimated using the rating system outlined in **Table 7.5**.

Table 7.3 Definition of probability ratings

PROBABILITY RATINGS	CRITERIA
Definite	Estimated greater than 95 % chance of the impact occurring.
Probable	Estimated 5 to 95 % chance of the impact occurring.
Unlikely	Estimated less than 5 % chance of the impact occurring.

Table 7.4 Definition of confidence ratings

CONFIDENCE RATINGS	CRITERIA
Certain	Wealth of information on and sound understanding of the environmental factors potentially influencing the impact.
Sure	Reasonable amount of useful information on and relatively sound understanding of the environmental factors potentially influencing the impact.
Unsure	Limited useful information on and understanding of the environmental factors potentially influencing this impact.

Table 7.5 Definition of reversibility ratings

REVERSIBILITY RATINGS	CRITERIA
Irreversible	The activity will lead to an impact that is in all practical terms permanent.
Reversible	The impact is reversible within 2 years after the cause or stress is removed.

7.4 NEED FOR ADDITIONAL INFORMATION: SPECIALIST STUDIES

In reviewing the potential environmental impacts, all impacts initially identified during the Scoping phase have been identified as being of concern and requiring further investigation. Accordingly, we propose to undertake the following specialist studies, in order to address a suite of potential environmental impacts.

Study	Consultant and Organisation
Air quality impact assessment	Lucian Burger of AirShed Planning Professionals
Noise impact assessment	Derek Cosijn of Jongens Keet Associates
Visual impact assessment	Eamonn O'Rourke of Strategic Environmental Focus (SEF)
Terrestrial ecology assessment (including toxicology)	Johann du Preez of Makecha Development Association; Jan Myburgh under InfoTox
Aquatic ecology assessment	Daniel Otto of Golder Associates
Groundwater assessment	Andrew Johnstone of GCS
Risk assessment	Mike Oberholzer of Riscom
Archaeological impact assessment	Johnny van Schalkwyk (private consultant)
Socio-economic assessment	Ben van der Merwe of Urban-Econ
Social impact assessment	Ilse Aucamp of Ptersa Environmental Management Consultants
Land use planning study	Wim Jacobzs of Winterbach, Potgieter and Associates
Traffic assessment	Louis de Villiers Roodt of Ndodana Consulting Engineers
Agricultural potential assessment	Alta van Dyke of Ivuzi Environmental Consulting

The ToR for these investigations as well as the identified specialists are outlined **Chapter 6**. A short summary of the various specialist consultants is given below. CVs are available upon request.

Airshed Planning Professionals, led by ***Dr Lucian Burger***, has been appointed to undertake the air quality impact assessment. Lucian Burger is the Managing Director of Airshed Planning Professionals. His postgraduate studies (MSc Eng and PhD) were specifically focused on the development of dispersion modelling theory and related software applications.

Dr Burger has completed numerous atmospheric dispersion studies locally and internationally, ranging from environmental impact assessments, risk and hazard assessments, meteorological studies, process designs, to the development of toxic gas evacuation response systems, and

other related software. Power stations assessed by Dr Burger include, *inter alia*, Kelvin Power Station (Johannesburg), Athlone Power Station (Cape Town), regional impacts of all Eskom power stations, and Kendal, Matimba, Duvha and Majuba Power Stations in particular. Dr Burger has published more than fifty scientific publications in the open literature and many confidential technical publications, reports, business proposals and reviews.

Mr Derek Cosijn is a partner with Jongens Keet Associates and has over 40 years of experience over a wide range of civil engineering, transportation planning, environmental and acoustic engineering projects. Mr Cosijn has been actively involved in numerous environmental projects since 1975 and his area of special expertise is environmental noise (acoustical engineering). The environmental projects have ranged through EIAs and noise impact assessments, policy formulation and procedural guideline development. Some of the 110 odd environmental and noise impact projects with which he has been involved with over the last 10 years are the City of Tshwane Noise Management Policy, Gautrain Noise Impact Study, Tutuka Power Station Coal Supply Railway Noise Impact Assessment, Majuba Power Station Coal Supply Railway Noise Impact Assessment, Gauteng Freeway Congestion SEA Noise Impact Assessment, Petronet Multi-product Pipeline (Northern Section) Noise Impact Assessment, Medupi Power Station Noise Impact Assessment, Olifants River Water Resources Development Project Noise Impact Assessment, Steelpoort Pump Storage Scheme Power Station.

Strategic Environmental Focus' landscape architecture unit has been appointed to undertake the VIA. The team will be led by ***Mr Eamonn O'Rourke***, a Landscape Architect with over 14 years experience in the field. He has undertaken a suite of VIAs for a range of projects in the mining and industrial sector and for linear infrastructure developments. As the Unit Manager of the Landscape Architecture unit in Stategic Environmental Focus Mr O'Rourke is responsible for, *inter alia*, the research, co-ordination and compilation of landscape rehabilitation programmes and visual impact assessments and mitigation recommendations. Mr O'Rourke has worked on numerous infrastructure projects including transmission lines and power stations such as the Kendal and Vaal South power stations and the Kudu transmission & substation.

Mr Johan du Preez of Makecha Development Associates has over 24 years experience in the environmental field. Dr du Preez has been involved in numerous specialist studies for various developments including business and open space developments, fuel filling stations, housing developments, pipelines, power lines, roads, sewage works and reservoirs. Dr du Preez is the author of 36 research articles and technical reports and is a senior lecturer in ecology and environmental management at the University of the Free State.

Mr Jan Myburgh is a qualified veterinarian with over 10 years experience in service rendering (clinical veterinary work) to commercial and small-scale farmers in the Gauteng and Northwest Province. Clinically, he has a special interest in bovine medicine (pharmacology and toxicology) and reproduction. Mr Myburgh currently works for the University of Pretoria and is a senior lecturer in the Department of Paraclinical Sciences and is responsible for teaching Pharmacology and Toxicology to pre- and postgraduate students. Mr Myburgh will be working under the auspices Dr Willie van Niekerk of Infotox.

Mr Myburgh was the main or co-author of 15 articles published in refereed journals and 27 articles published in non-refereed journals or proceedings. He also contributed one chapter (as a co-author) to the book, *Infectious Diseases of Livestock*, which was published in 1994. Mr Myburgh's main research interest is veterinary environmental problems. Research for his PhD was started in 2003 and will be based on the development of biomarkers for African aquatic species (Nile crocodile and Sharptooth Catfish) to facilitate detection of pollution or the presence of hazardous constituents in rivers and dams in southern and East Africa.

Mr Daniel Otto of Golder Associates has over 16 years experience in aquatic hydrology and has assisted in research such as passive treatment wetland projects and A Manual on Mine Water Management and Treatment Practices in South Africa. Mr Otto has lectured at the Vista University in Johannesburg and has also worked as a researcher. Mr Otto specializes in environmental rehabilitation, environmental management plans implementations, audits, liability assessment and environmental risk assessment audits.

Mr Andrew Johnstone is the founder and Managing Director of GCS. He has over 24 years experience as a geohydrologist and has under numerous studies as part of EIA's. Mr Johnstone specializes in the exploration and design of wellfields in aquifers, mining related hydroheology, regional hydrogeological investigations and mapping, hydrochemical investigations (natural and contamination) and environmental due diligence investigations. Mr Johnstone has published over 11 papers.

Mr Michael Oberholzer is currently director of Riscom. He is a registered Professional Engineer holds a BSc (Chemical Engineering) from the University of the Witwatersrand (1982). Mr Oberholzer has over 20 years experience with Dow chemicals and Sentrachem in all aspects of project implementation. This includes Process Engineering Manger, Project Manager and Commissioning Manager. Since leaving Dow, Mike has concentrated on risk studies and completed a number of Risk Assessments studies and Process Hazard Analysis in various industries including offshore assignments in the oil and gas, chemical, petrochemical, agrochemicals, mining and food industries.

Mr Oberholzer has undertaken numerous risk assessments including those for the coal based power stations near Witbank and Vaal South, as well proposed peaking power plants in Kwazulu-Natal and Eastern Cape.

Dr Johnny van Schalkwyk, a private heritage consultant, has been appointed to undertake the requisite heritage impact assessment. Dr van Schalkwyk has undertaken over 800 archaeological, anthropological and social impact assessments, including the assessments of two power station projects in the Northern Free State and Mpumalanga and has worked in the Waterberg area previously. Other projects assessed include powerlines, roads, pipelines, dams, mine developments, water purification works, historical landscapes, refuse dumps and urban developments. Dr van Schalkwyk has published more than fifty papers on topics relating to anthropology, archaeology, history and impact assessment in various scientific journals. He is the current Head of Research of the National Cultural History Museum.

Mr Ben van der Merwe of Urban-Econ has wide-ranging knowledge and experience in economic development analyses. His special field of interest relates to the utilisation and application of the input-output technique in the development milieu. He has conducted various multi-sectoral economic development studies, which incorporated liaison with communities to ensure local involvement. Due to his interest in economic modelling and research, he has extended his expertise in industrial complexes, input/output and impact analyses to address urban management and spatial economic problems. Ben has developed and implemented innovative economic impact modelling techniques to quantify economic development indicators for capital expenditure projects, therefore equipping the firm with forefront modelling techniques. He has successfully managed and coordinated large research, data gathering and strategic development studies in the SADC countries. His management skills have been applied in numerous LED and database development studies.

Ms Ilse Aucamp is the Director of Ptersa Environmental Management Consultants and has been involved in social environment for over 13 years. Ms Aucamp has compiled numerous SIAs for various industries, including bulk water supply projects, smelters and resorts. Ms Aucamp is currently busy with a PhD in Social Sciences at the University of Pretoria. Her topic is: Social Impact Assessment in a South African Context: *An Integrated Social and Environmental Sciences Approach*. She has published and presented five papers at various conferences.

Mr Wim Jacobsz of Winterbach Potgieter & Partners Town and Regional Planners has been appointed to undertake this study. Winterbach Potgieter & Partners specialises in Town and Regional Planning and has undertaken extensive work in the Waterberg area, including numerous SDFs such as the Waterberg District Municipality. The firm does not concentrate on limited aspects of town planning but operates in the broader spectrum of planning and development, which acknowledges and respects the interrelations among the physical, natural, social and economic spheres of development. This includes, *inter alia*, regional, strategic and development Planning, SDFs, town planning schemes and amendment schemes and technical investigations.

Mr Louis Roodt of Ndodana Consulting Engineers, a transportation engineer with over 32 years experience in the transport sector. Mr Roodt has undertaken a number of Traffic Impact Assessments for various projects including shopping malls, municipal transport plans, industry and township establishment and rezoning applications. Mr Roodt is experienced in many aspects of transport work including road safety audits, the interaction of road geometry and driver behaviour, driving speed and collisions, interchange designs, geometric design of ramps and speed camera effectiveness.

Ms Alta van Dyk is the Managing Director of Ivuzi Environmental Consultants and has over 15 years experience in the environmental field focusing on impact assessments, water and waste aspects, remediation initiatives and legislative compliance. Ms van Dyke is registered with the South African Council for Natural Scientific Professions.

7.5 REASONABLE PROJECT ALTERNATIVES IDENTIFIED DURING SCOPING

Chapter 4 reviewed a range of project alternatives associated with the proposed activities. Pursuant to this Scoping exercise, which was based on input from the authorities, I&APs and various specialists, a shortlist of reasonable project alternatives has been identified for further, more detail investigation during the EIR phase, namely:

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

Other potential alternatives were considered and screened out in **Chapter 4**. These are documented in **Section 4.3**.

7.6 THE ENVIRONMENTAL IMPACT REPORT

The purpose of the EIR would be to undertake a comparative assessment of the relative significance of the potential environmental impacts for the proposed power station technology and layout alternatives. The EIR would thus include the following:

- A brief overview of the potential environmental impacts and reasonable alternatives identified during the Scoping investigation.
- A summary of the key findings of the various specialist studies as they pertain to the affected environment.
- An overview of the public participation process conducted during the compilation of the EIR.
- A detailed assessment of the significance of the potential environmental impacts for the various project alternatives. This assessment, which would use the methodology outlined in **Section 7.3.2**, would be informed by the findings of the specialist studies, professional judgement and comment from the various I&APs.
- An overview of the full range of mitigation measures including an indication of how these would influence the significance of any potential environmental impacts, together with a framework Environmental Management Plan. The mitigation measures would be informed by the specialist studies, professional experience and comment received from the I&APs.
- A set of recommendations regarding the way forward would be provided, should any of the proposed alternatives be authorised in terms of NEMA.

7.7 PUBLIC PARTICIPATION PROCESS

The purpose of the public participation process would be to provide I&APs with adequate opportunity to have input into the environmental process. The public participation process would include the following:

7.7.1 PUBLIC COMMENT ON THE DRAFT EIR

Following the completion of the Draft EIR (refer to **Section 7.6** above), it will be lodged at a suite of relevant libraries, Municipal offices and on the Eskom (www.eskom.co.za/eia) and Ninham Shand websites (www.ninhamshand.co.za). Registered I&APs will be notified of the lodging by means of letters, and given 30 days in which to comment on the report. During the comment period a public meeting would be held in Lephalale to enable I&APs to provide feedback on the draft report. The public would be notified of the meeting via a public notice in the local press and by way of the letter used to inform the I&APs of the lodging of the Draft EIR.

All written correspondence would be in English and Afrikaans. The public meeting would also be run in English and Afrikaans.

The public comments would be consolidated into an Annexure of the EIR. This would take the form of an Issues Trail, which would summarise the issues raised and provide the Project Team's responses thereto. The draft report would also be revised in light of feedback from the public.

a) Opportunity for appeal

All registered I&APs would be notified in writing of the release of the Environmental Authorisation. They would be reminded of their right to appeal against DEAT's decision to the Minister of Environmental Affairs and Tourism in terms of NEMA.

7.8 PROPOSED PROGRAMME

A summary of the proposed programme is given in the table below.

Table 7.6 Proposed EIA programme

Activity	Proposed date	Deliverable
2nd round of public engagement:		
• Letter to I&APs & adverts	4/11/2008	Informed I&APs
• Lodge draft SR in public venues and with Authorities	5/11/2008	Draft SR in libraries, websites etc.
• Open day & public meeting	26/11/2008	Public engagement
• Public comment period ends	9/01/2009	Updated issues trail
Submit final SR (incl. Plan of Study for EIR) to environmental authority	21/01/2009	Approved SR & PoS EIR
Specialist studies	11/2008 – 2/2008	Specialist reports
3rd round of public engagement:		
• Letter to I&APs & adverts	05/2009	Informed I&APs
• Lodge draft EIR in public venues	05/2009	Draft EIR in libraries, website etc.
• Open day & public meeting	06/2009	Public engagement
• Public comment period ends	06/2009	Updated issues trail
Submit final EIR to environmental authority	07/2009	Environmental Authorisation

7.9 PERSONNEL

As for the Scoping Report phase, Ninham Shands' Brett Lawson would provide strategic guidance to the EIA process and Ashwin West would undertake the management of the EIA process and, together with Louise Corbett, the requisite reporting. Mr Lawson is a certified EAPSA, and is registered as a Professional Natural Scientist with the South African Council for Natural Scientific Professions. Mr West is registered as a Professional Natural Scientist with the South African Council for Natural Scientific Professions.

Anelle Odendaal of Zitholele Consulting would facilitate the public participation process. A short summary of these consultants is given below. CVs are available upon request.

Mr Brett Lawson has spent 12 years in wildlife management and research with conservation agencies in southern and South Africa, and nine years in the more holistic field of environmental management in the National Lake Areas and with Eskom. Thereafter, Mr Lawson was one of the founders in 1995 of Bohlweki Environmental, the first emergent environmental consultancy established in South Africa, and later started The Environmental Partnership which he relinquished in 2004 as a fully empowered environmental consultancy. He thus has considerable multi-disciplinary experience across the range of environmental sciences.

As a Principal Environmental Practitioner, ***Mr Ashwin West*** has been involved in undertaking Environmental Impact Assessments, the development, implementation and auditing of Environmental Management Plans, water resources and augmentation studies and the development, implementation and auditing of Environmental Management Systems in South

Africa and the United Kingdom. Mr West has over six years experience and has undertaken numerous projects in the petrochemical, housing and service supply industries amongst others.

As an Environmental Practitioner, ***Ms Louise Corbett*** has been involved in undertaking Environmental Impact Assessments, the development and implementation of Environmental Management Plans, and the development and implementation of Environmental Management Systems. Ms Corbett has three years experience in the environmental field and has been involved with a variety of industries such as the petrochemical, housing, service supply and transport industries amongst others.

Mrs Anelle Odendaal of Zitholele Consulting has 10 years experience in managing public participation projects and awareness creation programmes. Her experience includes designing and managing countrywide public participation and awareness creation projects, managing multi-project schedules, budgets and achieving project goals. Mrs Odendaal has coordinated several dozens of stakeholder workshops, forum meetings, focus group meetings and public meetings, some of which on international scale. She has coordinated the production of a wide variety of publications transferring scientific and technical material in non-technical languages to readers representing all spheres of society.

8 CONCLUSIONS AND WAY FORWARD

The purpose of this Chapter is to briefly summarise and conclude the Scoping Report and describe the way forward.

8.1 CONCLUSIONS

As per the requirements of NEMA, this Scoping investigation has reviewed a range of project alternatives and contemplated the array of potential environmental impacts associated with the following proposed activities in the Waterberg region:

- The establishment of two coal-fired power stations of approximately 5 400 MW of generation capacity each; and
- The establishment of ancillary infrastructure including amongst other things a WWTW, a WTW, including a demineralisation plant, ash disposal facility and SO_x abatement measures.

The following feasible alternatives have been identified for further consideration in the EIR:

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

Specifically the following potential environmental impacts have been identified for further consideration in the EIR:

- Operational phase impacts on the biophysical environment:
    - Impact on terrestrial fauna and flora;
    - Impact on aquatic fauna and flora;
    - Impact on ambient air quality;
    - Impact on founding conditions; and
    - Impact on groundwater resources.
- Operational phase impacts on the social environment:
    - Visual impacts;
    - Noise impacts;
    - Impact on health of surrounding landowners;
    - Risk assessment;
    - Impact on heritage resources;
    - Impact on local economy;
    - Impact on land use and planning;

- Impact on livelihood security;
- Impact on tourism;
- Impact on traffic; and
- Impact on agricultural potential.

- Construction phase impacts on the biophysical and social environments

The following specialist studies and specialists will be commissioned to provide more detailed information on those environmental impacts which have been identified as potentially being of most concern, and/or where insufficient information is available, namely:

Study	Consultant and Organisation
Air quality impact assessment	Lucian Burger of AirShed Planning Professionals
Noise impact assessment	Derek Cosijn of Jongens Keet Associates
Visual impact assessment	Eamonn O'Rourke of SEF Jan Myburgh under InfoTox
Terrestrial ecology assessment (including toxicology)	Johann du Preez of Makecha Development Association
Aquatic ecology assessment (including wetland delineation)	Daniel Otto of Golder Associates
Groundwater assessment	Andrew Johnstone of GCS
Risk assessment	Mike Oberholzer of Riscom
Archaeological impact assessment	Johnny van Schalkwyk (private consultant)
Socio-economic assessment	Ben van der Merwe of Urban-Econ
Social impact assessment	Ilse Aucamp of Ptersa Environmental Management Consultants
Land use planning study	Wim Jacobzs of Winterbach, Potgieter and Associates
Traffic assessment	Louis de Villiers Roodt of Ndodana Consulting Engineers
Agricultural potential assessment	Alta van Dyke of Ivuzi Environmental Consulting

The rationale for these specialist investigations and the ToR has been outlined under the relevant impacts in **Chapter 6** of this report.

The approach to the EIR phase should be conducted in terms of the guidelines outlined in the Plan of Study for EIA in **Chapter 7**.

8.2 THE WAY FORWARD

The next stage of the public participation process involves the lodging of the DSR and the hosting of a public meeting to receive feedback on the DSR.

The open day and public meeting will be held on 26 November 2008. The details are as follows:

Date	***Venue***	***Time***
26 November 2008	Mogol Club, Conference Centre, Lephalale	16:00 – 20:00

Note that the formal meeting will only start at 18:00. An open day will be held before this whereby information is on view (e.g. posters and maps).

Copies of this DSR have been lodged in the following locations:

- Local Municipal Office, Lephalale;
- Lephalale Main Public Library;
- Agri Lephalale local office;
- Marapong Clinic (Tlou Street, Marapong);
- Lephalale District Agricultural Union;
- www.eskom.co.za/eia; and
- www.ninhamshand.co.za.

Written comments on the report will be received until 9 January 2009. Cognisance will be taken of all comments when compiling the final report, and the comments, together with the study team's and client's responses thereto, will be included as an Annexure in the final Scoping Report. Where necessary, the report will be updated to take these comments into account.

Once the final Scoping Report has been completed and all I&AP comments have been incorporated into the report, and the client has approved the report, it will be submitted to DEAT and DEDET for their review and comment, respectively. DEAT will either reject the application or instruct the applicant to proceed to the EIR phase, either as proposed in the Plan of Study for EIR, or direct that amendments are made before continuing.

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9.3 PERSONAL COMMUNICATION

Personal communication between M Wynne of Ninham Shand and A West of Ninham Shand by e-mail on 16/01/2008.

Personal communication between W Comrie of Ninham Shand and L Corbett of Ninham Shand by e-mail on 1410/08 regarding W Comrie's work under Ockie van den Berg of DWAF National Water Resource Planning: Options analysis.