UPDATE SUMMARY: FINAL ENVIRONMENTAL IMPACT REPORT: APRIL 2007

This Update Summary describes the process followed since the Draft Environmental Impact Report (EIR) for Eskom's proposed addition of three generating units at the approved Open Cycle Gas Turbine (OCGT) plant at Mossel Bay was made available to interested and affected parties (I&APs) for their comment. It also indicates how the finalisation of the EIR has responded to public and review input and outlines the way forward in the environmental decision-making process.

PROCESS SINCE RELEASING THE DRAFT ENVIRONMENTAL IMPACT REPORT

The public participation process undertaken during the EIR Phase was as follows:

- The Draft EIR was lodged at the Mossel Bay, D'Almeida and KwaNonqaba Public Libraries, and on the Eskom and Ninham Shand websites, at *www.eskom.co.za/eia* and *www.ninhamshand.co.za* respectively, on 22 March 2007. The commenting period closed on 23 April 2007.
- Registered I&APs were notified of the availability of the Draft EIR by means of a letter which included a copy of the Draft EIR Summary.
- Media notices were placed in the Mossel Bay Advertiser on 16 March 2007 in English and Afrikaans, and 23 March 2007 in isiXhosa, in order to notify I&APs of the availability of the Draft EIR and to invite them to the third public forum.
- The third pubic forum, which comprised a formal presentation and an open public meeting at the Mossel Town Hall, was held on 28 March 2007. The findings of the Draft EIR were presented and an opportunity provided for I&APs to raise concerns and comments. Minutes of the meeting have been distributed.
- A focus group meeting with representatives of the Dana Bay Residents Association, to address their specific concerns, was also held on 28 March 2007 and minutes of the meeting have been distributed.

The comments received during the commenting period for the Draft EIR, as well as the Issues Trail compiled in response to the comments, are presented as an annexure to this finalised EIR.

UPDATING OF THE DRAFT ENVIRONMENTAL IMPACT REPORT

Updating of the Draft EIR to this Final EIR has entailed the following:

- Amending typographical and other insignificant errors that appeared in the Draft EIR and indicating these and other changes in the main body of this report by underlining;
- Updating the Public Participation Process to reflect the latest round of public engagement (also underlined);
- Meeting with a wide array of commenting authorities to elicit their comments, as presented as an annexure to this finalised EIR;

- Undertaking peer review of the specialist studies and reflecting this in an annexure to this finalised EIR;
- Confirming the recommendations regarding the project actions and mitigatory measures; and
- Appending the following additional annexures ~
    - Annexure P: Minutes from focus group and public meetings;
    - Annexure Q: Issues Trail and copies of submissions;
    - Annexure R: Comments and responses from other authorities;
    - Annexure S: Specialist peer review documentation; and
    - Annexure T: Supplementary information (18 May 2007).

The Draft EIR has been updated to this Final EIR by means of the inclusion of this Update Summary, the incorporation of the above changes in the text of the report, as well as the additional annexures as listed. Significant amendments to the body of the report are indicated by means of underlining in the final version, to enable readers to track the changes.

THE WAY FORWARD

This finalised EIR has been submitted to the Department of Environmental Affairs and Development Planning (DEA&DP) for their consideration.

Once they have considered the document and are satisfied that it provides sufficient information to make an informed decision, DEA&DP will determine the environmental acceptability of the recommended project actions and mitigatory measures. Thereafter, DEA&DP will issue a Record of Decision and any conditions of approval relative to the authorisation, should the proposed activity be approved.

Following the issuing of the Record of Decision, DEA&DP's decision will be communicated by means of letters to all identified interested and affected parties. A 30-day appeal period follows, during which interested and affected parties will have an opportunity to appeal against the decision to the Provincial Minister of Environmental Affairs and Development Planning, in terms of the National Environmental Management Act (Act No. 107 of 1998).

We would like to thank all those who have participated in the EIA process for the proposed additional generating units at the Mossel Bay OCGT plant.

30 April 2007

REPORT SUMMARY

BACKGROUND AND INTRODUCTION

Eskom is proposing to expand their Open Cycle Gas Turbine (OCGT) plant at Mossel Bay, which entails the installation of three additional generating units at the approved plant presently nearing completion adjacent to the PetroSA Gas to Liquid (GTL) refinery. The decision to pursue an expansion of Eskom's electricity generation capacity is based on national policy and informed by on-going strategic planning undertaken by the national Department of Minerals and Energy (DME), the National Energy Regulator of South Africa (NERSA) and Eskom.

The Environmental Impact Assessment (EIA) being undertaken was initiated in September 2006 with the completion and submission of the NEMA EIA Application Form. A motivation for exemption from having to consider alternatives was submitted with the NEMA EIA Application Form. Because Eskom is a State Owned Enterprise, the national Department of Environmental Affairs and Tourism (DEAT) is the default competent environmental authority. However, DEAT has delegated this responsibility to the provincial Department of Environmental Affairs and Development Planning (DEA&DP).

The sequence of documents produced thus far in the EIA process is:

- The NEMA EIA Application Form, which represented the formal initiation of the EIA process;
- A Draft Scoping Report and Plan of Study for EIA that was distributed for public comment during October 2006;
- A Final Scoping Report and Plan of Study for EIA that was submitted to DEA&DP in November 2006;
- An Amended Final Scoping Report and Plan of Study for EIA that was submitted to DEA&DP in March 2007;
- A Draft Environmental Impact Report (EIR) that was distributed for public and authority comment during March 2007; and
- The present Final EIR submitted to DEA&DP in April 2007.

DEA&DP's acceptance of the Amended Final Scoping Report and approval of the Plan of Study for EIA was received on 13 March 2007 and allowed the assessment phase of the EIA process, as reflected in this Final EIR, to be undertaken.

PROJECT DESCRIPTION

The project entails the addition of three 150 MW units to the OCGT power plant of three 150 MW units that is currently under construction near the PetroSA Gas to Liquid (GTL) facility near Mossel Bay. The three proposed additional units of 150 MW each will therefore result in an increase in total output of the OCGT plant of 450 MW, i.e. to a combined total output of 900 MW.

The proposed project therefore comprises the following:

- Three additional gas turbine units with an output of 150 MW each;
- fuel storage facility with a total storage capacity of 5.4 million litres;
- a propane storage facility of 13m^3;
- two conservancy tanks, each with a capacity of 6 000 litres;
- a control room;
- a fuel supply pipeline;
- a water supply pipeline; and
- a high voltage (HV) yard.

Fuel and water supply from the adjacent PetroSA GTL facility would be by means of continuations of the existing pipelines within the OCGT precinct. The extended HV yard would be located immediately north of the proposed three units and would enable the electricity generated to then be transported to the Proteus substation via the authorised and recently commissioned 400 kV transmission lines. The total area required to be subdivided and re-zoned for the proposed units and associated infrastructure is approximately 25 ha. Access would be via the access road to the existing OCGT power plant. The highest points of the plant would be the three emission stacks, likely to be about 30 m high.

An array of potential impacts, both for operational and construction circumstances and encompassing biophysical as well as socio-economic factors, have been identified and evaluated in the EIA process and reflected in this Final EIR.

ALTERNATIVES AND THEIR ASSESSMENT

While there is a requirement to examine alternatives per the regulations that apply to environmental authorisation for development proposals, the present application includes a motivation to DEA&DP for exemption from this requirement. The rationale behind the proposed site and project alternatives is provided in this Draft EIR, based on the fact that the proposed additional units are essentially an upgrading of the OCGT power plant and accordingly alternative geographical locations will not be considered in this EIA. In terms of specific sites, the area to the west of the OCGT power plant is the only feasible option. This is due to the OCGT HV yard to the north, PetroSA's expansion plans to the east and the potential expansion of the landfill site to the south. Motivated by the need for peaking electricity generation, alternative technologies for this capacity increase are not considered in this EIA process. The power station currently under construction comprises specific gas turbine technology, hence from an integration point of view, it is required to utilise the same technology for the additional generating units. OCGT technology is "off-the-shelf", and, using this technology, will assist in meeting the deadline of winter 2008 for the additional units to be operational. Process alternatives (e.g. measures to abate oxides of nitrogen) have been examined in the previous EIA process and the alternatives selected during that process would be implemented for the proposed OCGT units as well. Hence process alternatives are not further investigated as part of this EIA process.

PUBLIC PARTICIPATION

A comprehensive public participation process was undertaken during the Scoping phase of this EIA process, as reflected in the Scoping Report of March 2007.

The public participation process undertaken during the EIR phase comprised the following:

- The Draft EIR was lodged at the Mossel Bay, D'Almeida and KwaNonqaba Public Libraries, and on the Eskom and Ninham Shand websites, at *www.eskom.co.za/eia* and *www.ninhamshand.co.za* respectively, on 22 March 2007. The commenting period closed on 23 April 2007.
- Registered I&APs were notified of the availability of the Draft EIR by means of a letter which included a copy of the Draft EIR Summary. See Annexure H.
- Media notices were placed in the Mossel Bay Advertiser on 16 March 2007 in English and Afrikaans, and 23 March 2007 in isiXhosa, in order to notify I&APs of the availability of the Draft EIR and to invite them to the third public forum. See Annexure I.
- The third pubic forum, which comprised a formal presentation and an open public meeting at the Mossel Town Hall, was held on 28 March 2007. The findings of the Draft EIR were presented and an opportunity provided for I&APs to raise concerns and comments. Minutes of the meeting have been distributed and a copy is presented in Annexure P.
- A focus group meeting with representatives of the Dana Bay Residents Association, to address their specific concerns, was also held on 28 March 2007 and minutes of the meeting have been distributed and a copy is presented in Annexure P.

The comments received during the commenting period for the Draft EIR, as well as the Issues Trail compiled in response to the comments, are presented as Annexure Q of this finalised EIR.

FINDINGS OF THE ASSESSMENT

The table below shows the expected level of impact of the operation of the proposed development on the biophysical and socio-economic environment. The most significant impacts *without mitigation* are as follows:

- Geology and drainage.
- Visual impact.
- Noise impact.
- Socio-economic impact.

Impact	OCGT power plant & transmission substation	
	No mitigation	With mitigation
IMPACT OF THE PROPOSED DEVELOPMENT ON THE BIO-PHYSICAL ENVIRONMENT		
Impact on flora	N (none)	L (low)
Impact on fauna	L	VL (very low)
Impact on avifauna	N	VL
Impact on air quality	N	L
Geology & drainage	M (medium)	VL
IMPACT OF THE PROPOSED DEVELOPMENT ON THE SOCIAL ENVIRONMENT		
Visual impact	H (high)	M
Impact on noise levels	H	L
Impact on socio-economic conditions	M	M+
CONSTRUCTION PHASE IMPACTS OF THE PROPOSED DEVELOPMENT		
Impact on noise levels	L	VL
Water and soil pollution	L	VL

However, with the recommended mitigatory measures being instituted, these impacts can be reduced to an acceptable level.

With reference to construction phase impacts of the proposed development, no particular areas of concern have been identified, given that prescribed environmental control measures are implemented by means of a recommended Project Specification Environmental Management Plan.

A Project Specification Environmental Management Plan has been developed to guide construction and operational phases of the proposed project. The implementation of this plan would minimise the possible negative impacts of construction and operation and assigns responsibility for environmental controls.

CONCLUSION AND WAY FORWARD

The comments received during the commenting period for the Draft EIR, as well as the Issues Trail compiled in response to comments, are presented as an annexure to the finalised EIR.

This finalised EIR has been submitted to the Department of Environmental Affairs and Development Planning (DEA&DP) for their consideration. Registered I&APs will be informed of the submission by letter and a copy of the *Update Summary*, as well as copies of meeting minutes and the Issues Trail where appropriate.

Once they have considered the document and are satisfied that it provides sufficient information to make an informed decision, DEA&DP will determine the environmental acceptability of the recommended project actions and mitigatory measures. Thereafter, DEA&DP will issue a Record of Decision and any conditions of approval relative to the authorisation, should the proposed activity be approved.

Following the issuing of the Record of Decision, DEA&DP's decision will be communicated by means of letters to all identified interested and affected parties. A 30-day appeal period follows, during which interested and affected parties will have an opportunity to appeal against the decision to the Provincial Minister of Environmental Affairs and Development Planning, in terms of the National Environmental Management Act (Act No. 107 of 1998).

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GLOSSARY OF TERMS

Base load	the electricity produced by a power station operating at a load factor of > 60 %.
Environment	The surroundings within which humans exist and that are made up of- (i) the land, water and atmosphere of the earth; (ii) micro-organisms, plant and animal life; (iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and (iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being;
Environmental impact	an environmental change caused by some human act
Environmental Impact Assessment (EIA)	a study of the environmental consequences of a proposed course of action.
Environmental Impact Report (EIR)	a report describing the assessment of the environmental consequences of a proposed course of action
Public Participation Process	a process of involving the public in order to identify needs, address concerns, choose options, plan and monitor in terms of a proposed project, programme or development
Red Data Book (South African)	an inventory of rare, endangered, threatened or vulnerable species of South African plants and animals
Scoping	a procedure for determining the extent of, and approach to, an EIA, used to focus the EIA to ensure that only the significant issues and reasonable alternatives are examined further
Scoping Report	a report describing the issues identified

ABBREVIATIONS

BID	Background Information Document
CARA	Conservation of Agricultural Resources Act (No. 43 of 1983)
DEA&DP	Department of Environmental Affairs and Development Planning (provincial)
DEAT	Department of Environmental Affairs and Tourism (national)
ECA	Environment Conservation Act (No. 73 of 1989)
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EIR	Environmental Impact Report
GTL	Gas-to-liquid
HIA	Heritage Impact Assessment
HWC	Heritage Western Cape
I&APs	Interested and Affected Parties
IEP	Integrated Energy Plan
IEM	Integrated Environmental Management
ISEP	Integrated Strategic Electricity Planning
Km	Kilometer
kV	Kilovolts
m	Metres
m^3	Cubic metres
MW	Megawatt
NEMA	National Environmental Management Act (No. 107 of 1999)
NER	National Electricity Regulator
NIRP	National Integrated Resource Plan
NO_x	Oxides of nitrogen
OH	Open House
OCGT	Open Cycle Gas Turbine
ppm	Parts per million
RoD	Record of Decision
ToR	Terms of Reference
VIA	Visual Impact Assessment

1 INTRODUCTION

1.1 BACKGROUND

Eskom Holdings Limited (Eskom) is the primary supplier of electricity in South Africa, providing approximately 95% of the electricity consumed. The decision to pursue an expansion of Eskom's electricity generation capacity is based on national policy and informed by on-going strategic planning undertaken by the national Department of Minerals and Energy (DME), the National Energy Regulator of South Africa (NERSA) and Eskom. The hierarchy of policy and planning documentation that reflects this state of affairs is illustrated by Figure 1 and is further described below.

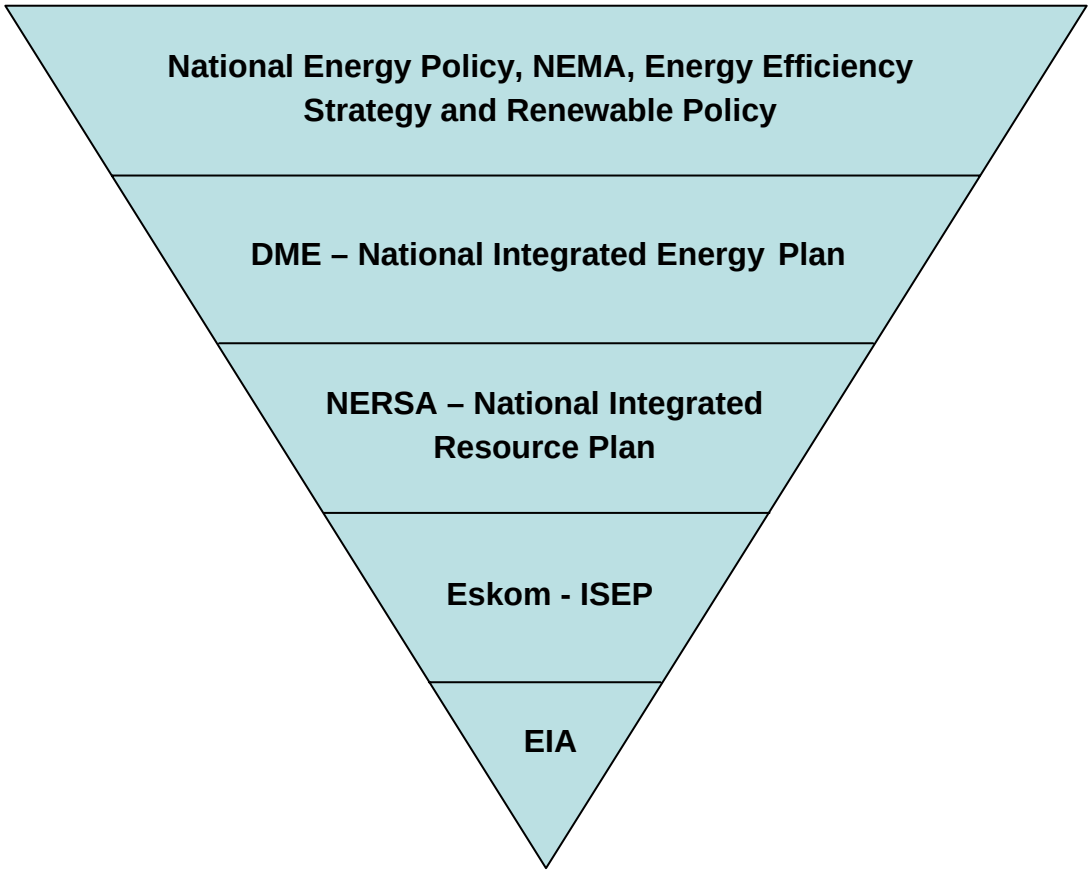

Figure 1: Hierarchy of policy and planning documents

1.1.1 White Paper on the Energy Policy of the Republic of South Africa - 1998

Development within the energy sector in South Africa is governed by the White Paper on a National Energy Policy, published by DME in 1998. This White Paper sets out five objectives for the further development of the energy sector. The five objectives are as follows:

- Increased access to affordable energy services;
- Improved energy governance;
- Stimulating economic development;
- Managing energy-related environmental and health impacts; and
- Securing supply through diversity.

Furthermore, the National Energy Policy identified the need to undertake an Integrated Energy Planning (IEP) process in order to achieve a balance between the energy demand and resource availability, whilst taking into account the health, safety and environmental[1] parameters. In addition, the policy identified the need for the adoption of a National Integrated Resource Planning (NIRP) approach to provide a long-term, cost-effective resource plan for meeting electricity demand, which is consistent with reliable electricity supply and environmental, social and economic policies.

1.1.2 Integrated Energy Plan (IEP) – 2003

The DME commissioned the IEP to provide a framework in which specific energy policies, development decisions and energy supply trade-offs can be made on a project-by-project basis. The framework is intended to create a balance in providing low cost electricity for social and economic development, ensuring a security of supply and minimising the associated environmental impacts.

The IEP projected that the additional demand in electricity would necessitate an increase in electricity generation capacity in South Africa by 2007. Furthermore, the IEP has concluded that, based on energy resources available in South Africa, coal will be the primary fuel source for the current expansion period.

1.1.3 National Integrated Resource Plan (NIRP) – 2003/2004

In response to the White Paper's objective relating to affordable energy services, the National Electricity Regulator (now NERSA) commissioned a NIRP. The objective of the NIRP is to determine the least-cost supply option for the country, provide information on the opportunities for investment into new power stations and evaluate the security of supply.

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

- A 2.8% average annual economic growth;
- The development and expansion of a number of large energy-intensive industrial projects;
- Electrification needs;
- A reduction in the number of electricity consumers – NIRP anticipates people switching to the direct use of natural gas;
- The supply of electricity to large mining and industrial projects in Namibia and Mozambique; and

- Typical demand profiles.

The outcome of the NIRP determined that while the coal-fired option of generating electricity would still be required over the next 20 years, additional energy generation facilities would be required by 2007[2].

1.1.4 Eskom Integrated Strategic Electricity Planning (ISEP) – 2005

Eskom applies an Integrated Strategic Electricity Planning (ISEP) process to identify long-term options regarding both the supply and demand sides of electricity provision in South Africa. The most recently approved ISEP plan (October 2005) identifies the need for increased peaking[3] supply by about 2006/7 and base load[4] by about 2010. Figure 2 below illustrates Eskom's "project funnel", which shows the range of supply options being considered by Eskom to meet the increasing demand for electricity in the country[5]. There are currently approximately 43 projects in the project funnel ranging, from left to right, from research projects to new-build projects.

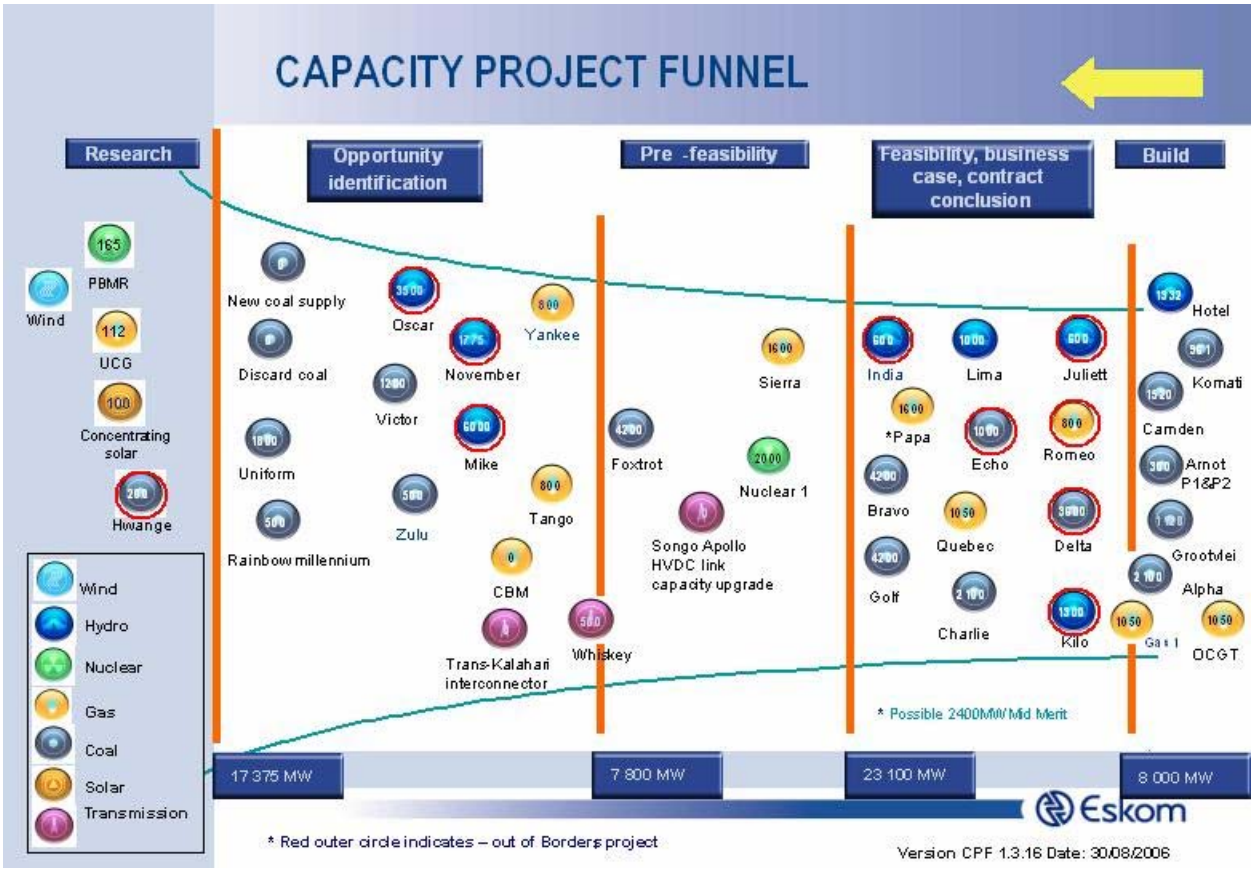

Figure 2: Project funnel

[1] Environmental parameters include biophysical, economic and social aspects.
[2] A revision and updating of the NIRP referred to here, including public comment, is currently underway.
[3] Peaking refers to the periods between 07:00 and 09:00 in the mornings and 18:00 and 20:00 in the evenings when electricity use is at its greatest.
[4] Base load refers to the electricity generated to meet the continuous need for electricity at any hour of day or night.
[5] Please note that within each category (e.g. the "prefeasibility" category) of the funnel, the position of a project relative to other projects within that category is not an indication of its state of relative progress.

The OCGT power plants currently being constructed in Mossel Bay and Atlantis as well as the proposed additional units fall within the "Build" portion of the project funnel.

1.2 THE PROPOSED PROJECT

As a consequence of the above-mentioned forward planning process, two OCGT power plants were proposed in the Western Cape, one in Atlantis near to Cape Town and the other adjacent to the PetroSA facility (previously known as Mossgas) near Mossel Bay. Both these OCGT plants were authorised by the provincial Department of Environmental Affairs and Development Planning (DEA&DP) in December 2005 and construction commenced in January 2006.

Since then, there has been continued high growth in the demand for electricity[6]. Using the planning processes in place, Eskom has established that there is a need for additional peaking capacity in order to meet the revised projected growth in demand for electricity nationally. The most feasible option to meet these needs by the winter of 2008 is to install additional open cycle gas turbine generating capacity in the Western Cape. It is proposed that this capacity be added to the Atlantis and Mossel Bay plants, both of which are currently under construction and nearing completion.

In order to achieve the above, Eskom therefore proposes to construct three additional turbine units of a nominal capacity of 150 MW each, to increase by 450 MW the capacity of the existing Mossel Bay OCGT power plant currently under construction. The balance of the required additional capacity is proposed to be constructed at the Atlantis OCGT site, which is the subject of a separate EIA.

Each unit would generate approximately 150 MW of electricity, meaning that the proposed activity is listed in terms of Government Notice No. R. 387, under Chapter 5 of the National Environmental Management Act (NEMA) (No. 107 of 1998), *viz*.:

"1. The construction of facilities or infrastructure, including associated structures or infrastructure, for:
(a) the generation of electricity where-
  (i) the electricity output is 20 megawatts or more; or
  (ii) the elements of the facility cover a combined area in excess of 1 hectare;
(c) the above ground storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of 1000 cubic metres or more at any one location or site including storage of one or more goods, in a tank farm;
(e) any process or activity which requires a permit or license in terms of legislation governing the generation or release of emissions, pollution, effluent or waste and which is not identified in GN No. R 386 of 2006."

[6] The generating capacity of the OCGT power plant was based on an annual electricity growth of 2,6%. However, in March 2006, it was established that the growth rate was actually 4,1%.

The proposed development accordingly requires authorisation from the competent environmental authority via an Environmental Impact Assessment (EIA) process. In this case the competent environmental authority is DEA&DP (see section 1.3 below in this regard).

This EIA is being undertaken for three additional generating units at the Mossel Bay OCGT power plant and addresses the cumulative impact of the total nominal capacity. As there is insufficient space within the precinct of the power plant currently being constructed, it is proposed to locate the additional units immediately to the west of the existing power plant site, on Portion 1 of Farm Patrysfontein, Number 228. Please refer to Figure 3 for a locality map. The site of the OCGT power plant is located approximately 13 km west of the centre of the town of Mossel Bay, 5,5 km northwest of Dana Bay and approximately 1 km northwest of the PetroSA facility. A letter of consent from the landowner, as contemplated in Regulation 16 of Government Notice No. R. 385, under Chapter 5 of NEMA, was received and submitted with the NEMA EIA Application Form to the relevant environmental authorities in September 2006.

The Mossel Bay OCGT power plant would be fuelled with liquid distillate fuel (diesel) from the adjacent PetroSA gas-to-liquid (GTL) facility. No new transmission lines would need to be constructed. Each generating unit would be connected to a transformer in an extended high voltage (HV) yard that would step up the voltage of the electricity generated before feeding it into the approved 400 kV transmission lines already constructed, and thus into the Proteus substation.

This application is being subjected to a scoping and environmental impact assessment study in terms of Section 21 of Government Notice No. R. 385 of 21 April 2006 and exemption from the consideration of alternatives has been applied for. During this application process, consideration will be given to the following guideline documents:

- DEA&DP: NEMA EIA Guideline on Public Participation, November 2006;
- DEA&DP: NEMA EIA Guideline on Exemptions, November 2006;
- DEA&DP: Visual Guideline, June 2005;
- DEA&DP: EMP Guideline, June 2005; and
- DEA&DP: Biodiversity Guideline, June 2005.

1.3 THE EIA PROCESS TO DATE

The EIA being undertaken was initiated in September 2006 with the completion and submission of the NEMA EIA Application Form. The purpose of the Application Form was to:

- register the proposed project with the relevant environmental authority;
- identify those proposed activities that would require environmental authorisation; and
- identify and motivate for any exemption from the EIA regulations.

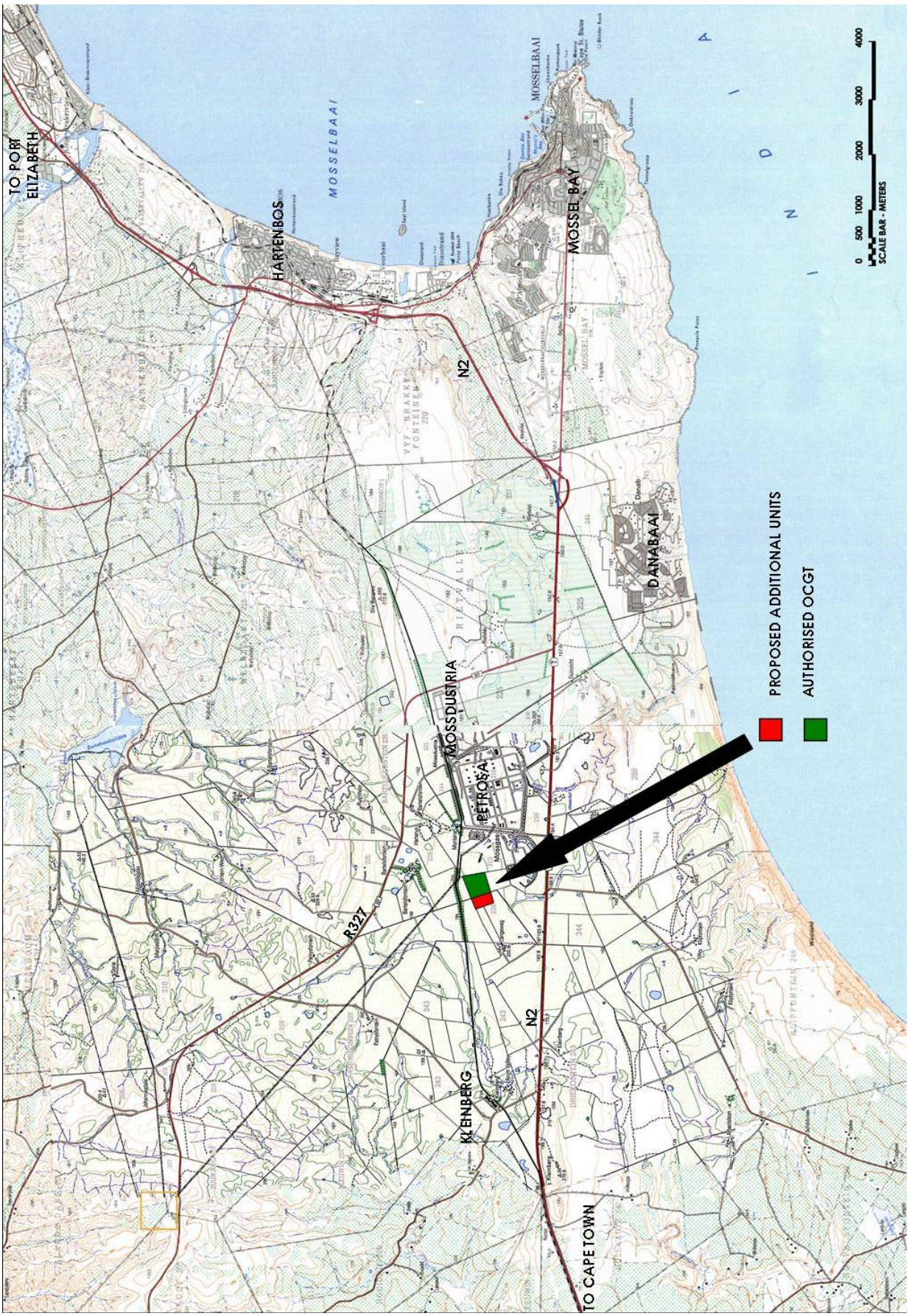

Figure 3: Locality map

In this case, a motivation for exemption from having to consider alternatives was submitted with the NEMA EIA Application Form. Alternatives are discussed in more detail in Section 1.5 of this report.

Because Eskom is a State Owned Enterprise, the national Department of Environmental Affairs and Tourism (DEAT) is the default competent environmental authority. However, due to the provincial DEA&DP having adjudicated on the initial Mossel Bay OCGT application and their concomitant familiarity with the implications of the proposed additional units, DEAT has delegated this responsibility to DEA&DP. The letter from DEA&DP of 17 October 2006 confirming this delegation was included as an annexure of the Scoping Report.

The sequence of documents produced thus far in the EIA process is:

- The NEMA EIA Application Form, which represented the formal initiation of the EIA process;
- A Draft Scoping Report and Plan of Study for EIA that was distributed for public comment during October 2006;
- A Final Scoping Report and Plan of Study for EIA that was submitted to DEA&DP in November 2006;
- An Amended Final Scoping Report and Plan of Study for EIA that was submitted to DEA&DP in March 2007[7];
- A Draft Environmental Impact Report (EIR) that was distributed for public and authority comment during March 2007; and
- The present Final EIR submitted to DEA&DP in April 2007.

DEA&DP's acceptance of the Amended Final Scoping Report and approval of the Plan of Study for EIA was received on 13 March 2007 (see Annexure A) and allowed the assessment phase of the EIA process, as reflected in this Final EIR, to be undertaken.

1.4 APPROACH TO THE PROJECT

Figure 4 below illustrates the EIA process that is being followed for the proposed development, and the project is currently in the authority decision-making phase regarding the Final EIR.

The EIA process, as described in Chapter 3, Part 3 of the NEMA regulations (Government Notice No. R. 385) comprises:

- The submission of an Application Form;

[7] The Draft Scoping Report of October 2006 had been finalised in light of comments received after the first round of public engagement and was submitted in November 2006 in its final form to DEA&DP for their consideration. However, on 21 December 2006, DEA&DP rejected the Scoping Report and Plan of Study for EIA for a number of reasons. The Scoping Report provides details of this state of affairs. In order to address the concerns of DEA&DP, the necessary amendment to the Final Scoping Report and Plan of Study for EIA was undertaken by Ninham Shand Consulting Services and made available to the public for review and comments before its resubmission to DEA&DP.

- A Public Participation Process;
- The compilation and submission of a Scoping Report;
- The compilation and submission of a Plan of Study for EIA; and
- The compilation and submission of an EIA Report.

This report documents the EIA Phase and has been finalised in light of public and authority engagement and submitted to DEA&DP.

The environmental assessment practitioners responsible for the EIA for the proposed additional OCGT units at Mossel Bay are:

- **Brett Lawson** ~ Masters degree in environmental science, certified as an environmental assessment practitioner with Environmental Assessment Practitioners of South Africa (EAPSA), registered as a professional natural scientist with the South African Council for Natural Scientific Professions (SACNASP), and 15 years experience in undertaking EIAs.

- **Charles Norman** ~ Technical bachelors degree in forestry and four years experience in adjudicating EIAs.

Declarations of independence on the part of the specialists commissioned during this EIA appear in Annexure N and documentation regarding peer review of the specialist studies is provided in Annexure S.

1.4.1 Authority involvement and decision-making

Apart from DEA&DP, there are other authorities who have been informed about the proposed project and provided with an opportunity to comment. These comprise:

- DEA&DP: Directorate of Pollution and Waste Management
- DEA&DP: Directorate of Strategic Environmental Management
- DEAT: Directorate of Air Quality Management and Climate Change
- South African National Roads Agency Limited (SANRAL)
- Department of Labour: Directorate of Occupational Health and Safety
- Heritage Western Cape
- Mossel Bay Municipality: Planning Department
- Mossel Bay Municipality: Chief Fire Officer
- PetroSA: Chief Fire Officer
- Chief Air Pollution Control Officer

These authorities have been provided with copies of the Draft EIR, to enable them to provide comment for inclusion in the Final EIR before submission to DEA&DP. See Annexure R for copies of these comments and responses from the proponent and EIA practitioner where appropriate. The Final EIR will provide the basis on which DEA&DP would decide whether to authorise the proposed activity.

1.5 ASSUMPTIONS AND LIMITATIONS

- Strategic, forward planning deliberations are reflected in the IEP, NIRP and ISEP planning processes and do not form part of this EIA.
- The wealth of information already in hand from the EIA process undertaken for the initial OCGT project provides a baseline from which this EIA process finds a point of departure.
- While there is a requirement to examine alternatives, the present application includes a motivation to DEA&DP for exemption from this requirement, as reflected in detail in the Scoping Report of March 2007[8]. See also Section 1.3 above in this regard.

[8] The proposed additional units are essentially an upgrading of the OCGT power plant and accordingly alternative geographical locations will not be considered in this EIA. In terms of specific sites, the area to the west of the OCGT power plant is the only feasible option. This is due to the OCGT HV yard to the north, PetroSA's expansion plans to the east and the potential expansion of the landfill site to the south. Motivated by the need for peaking electricity generation, alternative technologies for this capacity increase are not considered in this EIA process. The power station currently under construction comprises specific gas turbine technology, hence from an integration point of view, it is required to utilise the same technology for the additional generating units. OCGT technology is "off-the-shelf", and, using this technology, will assist in meeting the deadline of winter 2008 for the additional units to be operational. Process alternatives (e.g. measures to abate oxides of nitrogen) have been examined in the previous EIA process and the alternatives selected during that process would be implemented for the proposed OCGT units as well. Hence process alternatives have not been further investigated in the assessment phase of this EIA process.

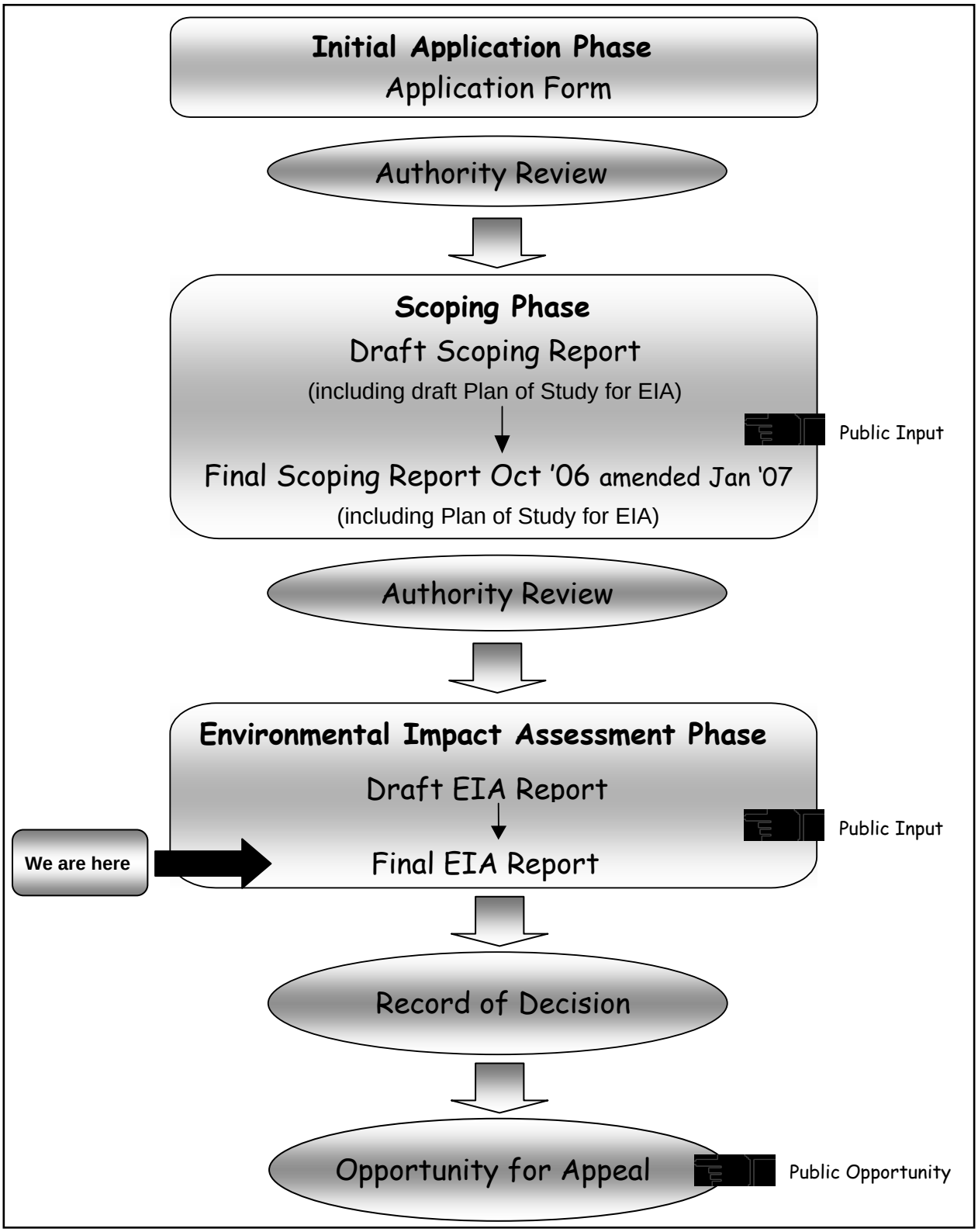

Figure 4: The EIA Process

1.6 STRUCTURE AND SCOPE OF THIS REPORT

This report is structured as follows:

Chapter One	*Provides the introduction, legislative requirements and background to the study* [Cf. Section 32 (2) (a) (f) (l) of Government Notice No. R. 385]
Chapter Two	*Describes the study area* [Cf. Section 32 (2) (c) (d) of Government Notice No. R. 385]
Chapter Three	*Describes the project components* [Cf. Section 32 (2) (b) of Government Notice No. R. 385]
Chapter Four	*Describes the public participation process* [Cf. Section 32 (2) (e) of Government Notice No. R. 385]
Chapter Five	*Describes the potential impacts and specialist studies* [Cf. Section 32 (2) (g) (h) (i) (j) (k) of Government Notice No. R. 385]
Chapter Six	*Concludes the report and indicates the way forward* [Cf. Section 32 (2) (m) (n) (o) of Government Notice No. R. 385]

A set of documentation verification checklists applied by Eskom to ensure that the requirements of the prescribed regulations are adequately addressed, is included as Annexure O.

2 STUDY AREA

2.1 FLORA

2.1.1 Introduction and context

The specialist botanical investigation undertaken by Nick Helme (Nick Helme Botanical Surveys, 2005) for the approved OCGT plant, provides relevant baseline information for the present study and is synthesized below. An additional specialist study to address potential ecological impacts of the expansion of the plant was undertaken by Conservation Management Services (see Annexure B) and the findings of the study are reflected in Chapter 5 below.

According to Nick Helme's report, at least three different recent projects have mapped the original vegetation of the study area. Because all three studies use different terminology and do not draw the same boundaries, a definitive picture is lacking. However, inconsistency in terminology is not a shortcoming in the specialist botanical report in question.

The CAPE project (Cowling *et al* 1999) maps the whole study area (at a relatively coarse scale) as being on the edge of Blanco Fynbos / Renosterveld Mosaic and Riversdale Coast Renosterveld (57% and 83.5% Irreplaceabilty respectively, according to that analysis). The SANBI vegetation map (Mucina & Rutherford 2003) maps the "Mossgas" area as a mix of Albertinia Sand Fynbos and Mossel Bay Shale Renosterveld. The recent National Spatial Biodiversity Assessment (Rouget et al 2004) indicates that the Sand Fynbos is a Vulnerable vegetation type (74% remaining) and that Shale Renosterveld (42% remaining) is an Endangered vegetation type. However, the STEP project, which refers to the entire study area as Herbertsdale Renoster Thicket (Cowling *et al* 2003), accurately describes the mix of Thicket and Renosterveld vegetation in the area. This vegetation type is dominant in the area between the Gouritz River and Mossel Bay, occurring on the shale and conglomerate hills, but has been heavily impacted by agriculture, and as a result persists mostly on the steeper slopes. Rapid urbanisation is having a substantial negative impact on this vegetation type (on both flats and steep slopes) in the Mossel Bay, Hartenbos, and Groot Brak areas, where it is also impacted by quarrying activities. Herbertsdale Renoster Thicket has been reduced to 38% of its original extent, with a conservation target of 25% (of the original extent), and it is thus regarded as an Endangered vegetation type in terms of STEP (Pierce 2003). The fact that both STEP (Pierce 2003) and the National Spatial Biodiversity Assessment (Rouget *et al* 2004) find that the area supports endangered vegetation types in a regional and national context is significant.

2.1.2 OCGT power plant and transmission substation site

The field on which the originally proposed OCGT plant, and associated transmission substation, is located had been recently and regularly ploughed, and also grazed by livestock. The site was dominated by grazing grasses such as *Eragrostis curvula* (weeping lovegrass), *Lolium* sp.

(ryegrass), and *Cynodon dactylon* (fynkweek), along with a few indigenous but weedy species such as *Gnidia* sp., *Kyllinga* sp., *Oxalis obtusa* (suuring)*, Lobelia erinus, Arctotheca calendula* (Cape weed), and the alien dandelion at the time of the site visits. No rare or localised plant species were likely to persist. This area had a very low local and regional conservation value.

Sensitive areas in the vicinity of the proposed plant include a 10m wide strip immediately south of the railway line, where remnant Renosterveld can be found. Species diversity is reduced due to agricultural activities, but includes *Barleria pungens, Digitaria velutina, Gnidia laxa, Gerbera piloselloides, Pycreus polystachyos, Hermannia saccifera, Aspalathus hispida, Drimia capensis* (maerman, jeukbol), and *Scabiosa columbaria*. No rare or localised species were found, and the likelihood of such species is low. This area has a moderate local and regional conservation value.

The most sensitive area in the vicinity of the originally proposed OCGT plant is a patch of approximately 1ha of Shale Renosterveld about 200m to the east. This patch occurs immediately east of a farm fence, and its northern border is the railway line. The vegetation here is a remnant piece of Mossel Bay Shale Renosterveld, which is, as noted, an Endangered vegetation type (Rouget et al 2004). The site is dominated by *Bobartia robusta*, which is a "Rare" Red Data listed species (Hilton Taylor 1996) restricted to this vegetation type west and north of Mossel Bay. Other species include *Rhus lucida* (blinktaaibos), *Metalasia pungens* (blombos), *Cynodon dactylon*, *Hypoxis setosa*, and *Falkia repens*. Various bulbs species are likely to be common, some of which may be rare and/or localised. This area has a very high local, and high regional conservation value, and should not be disturbed. Similar, but larger patches of remnant Renosterveld occur about 0.7km west of the originally proposed site.

In addition, the other habitat of moderate concern is a grassy wetland area to the southeast of the proposed site. This was a natural drainage line, but has been dammed and quite heavily transformed by agriculture, notably heavy stock grazing. The vegetation is dominated by grasses and sedges, most of which are common and widespread, resilient species, but occasional rare bulb species could be present. Botanical conservation value is low - moderate. The value of this area is of an ecological nature in that it is a wetland area supporting populations of frogs, invertebrates, and birds. The wetland effect extends at least 200m towards the current PetroSA plant from the small dam.

2.2 AVIFAUNA

The specialist avifaunal investigation for the approved OCGT plant was undertaken by Brett Lawson of Ninham Shand. The information provided below was extracted from the specialist report (Ninham Shand, 2005) and additional attention to avifaunal impacts was not deemed necessary for the proposed expansion of the plant, as described in Chapter 5 below.

According to the South African Bird Atlas Project (SABAP) data available for the study area (1:50 000 topo sheet no. 3421BB, Herbertsdale), one hundred and fifty seven bird species have been recorded in the area, of which 22 species are known to have been breeding.

Of the swimming, diving and wading birds, the expected array of cormorants, herons, egrets, geese and ducks have been recorded. It is of interest that flamingoes have not been recorded, probably due to the absence of suitable shallow water bodies. African black duck have also not been recorded but this might be due to their cryptic nature.

As far as diurnal raptors are concerned, the only two surprising absentees are the black eagle and the African goshawk. The fact that no owls were recorded can only be ascribed to observational shortcomings, since barn and eagle owls are likely to occur. Neither the common European or fierynecked nightjar have been recorded and this, together with the absence of owls, would suggest that nocturnal observations were limited.

Terrestrial and ground nesting birds are well represented, as are the aerial-feeders. As far as the latter are concerned, a few of the summer visitors are absent from the records.

The conglomeration of species that make up the passerines comprises the bulk of the remaining records. The array that is represented is typical of what would be expected to occur in the variety of habitats represented in the study area. With reference to the bird species within the study area which would have a particular conservation status, the following have been identified as being present:

- Cape cormorant ~ near threatened

This cormorant is endemic to southern Africa and is more common on the west coast than the east, where the study area is located. Essentially a marine species, they breed on offshore islands and feed in coastal waters. Nesting occasionally occurs on the mainland close to the shoreline or in estuaries but always in dense colonies. There are no records of them breeding in the study area. Given their preferred habitats for foraging and breeding, it is unlikely that the proposed OCGT power plant expansion would pose any risk to this species.

- Secretary bird ~ near threatened

Widespread throughout South Africa, this large ground-feeding bird does not spend much time in flight. Nevertheless, although they are ungainly on take-off and landing, secretary birds are strong fliers and can soar to great heights. Roosting and nesting occurs on the tops of trees but there are no breeding records in the study area. Due to their foraging in the open veld, it is unlikely that the proposed OCGT power plant expansion would pose any risk to this species.

- Cape vulture ~ vulnerable

Cape vultures were historically known to roost in a deeply incised section of the Gourits River just north of where it cuts through the Langeberg mountains south of Van Wyksdorp. Although these birds forage very widely, the records from the study area indicate no breeding activity and a low frequency of reporting. However, their low level of incidence would suggest that the risk to this species is slight.

- African marsh harrier ~ vulnerable

Typically found over marshlands, this resident raptor also occurs over cultivated lands. However, their feeding behaviour is to fly low over the ground. They also nest at ground level, although there are no records of breeding in the study area. This harrier is known to perch on low structures such as fences but also soars to some height. The risk to this species is not considered to be significant.

- Black harrier ~ near threatened

The black harrier is a local migrant and occurs in a wide range of habitats. It typically hunts close to the ground where it also perches on termite mounds or low structures. Nesting also occurs close to the ground, although there are no breeding records from the study area. Given its feeding and nesting behaviour, it is unlikely that the proposed OCGT power plant expansion would pose a significant risk to this species.

- Blue crane ~ vulnerable

The blue crane has broadened its range in the last few decades into the extensive croplands of the Western Cape. Feeding and nesting on the ground, this bird nevertheless flies strongly and soars to considerable height. There are records of it breeding in the study area and such behaviour may be marginally displaced. However, it is not known to perch on tall utility structures and it is unlikely that the proposed OCGT power plant expansion would pose any risk to this species.

- Stanley's bustard ~ vulnerable

A resident of the eastern arid and grassveld areas of South Africa, this bustard feeds and nests on the ground. There are no breeding records from the study area. Although it is a strong flyer and achieves some height, it is not known to use elevated perches. It is unlikely that the proposed OCGT power plant expansion would pose any risk to this species.

- White stork ~ Protected under Bonn Convention on Migratory Species

The white stork visits southern Africa from Europe during the northern winter. Although they do not breed here, these storks congregate in large numbers where sources of food are to be found. They are ground foraging birds and although they seek out dry savannahs and open grasslands when wintering, they also tend to congregate near to drainage lines and impoundments. The risk to this species is not considered to be significant.

2.3 VISUAL SIGNIFICANCE OF THE AREA

The visual assessment for the approved OCGT plant was undertaken by Tania de Villiers and Albert van der Stok of CNdV Africa. The information provided below has been extracted from the specialist report compiled by them (CNdV Africa, 2005) and provides relevant baseline information for the present study. An additional specialist study to address potential visual impacts of the expansion of the plant was undertaken by Visual Resource Management Africa (see Annexure C) and the findings of the study are reflected in Chapter 5 below.

The N2 National Road carries a high volume of tourist and other traffic between Cape Town and the Garden Route. The visual quality of the area is important for tourists. Any changes to the landscape can therefore have an impact on the tourist trade as well as affecting the visual experience of the local population.

Many people consider Mossel Bay as the start of the Garden Route. When driving towards Mossel Bay from Cape Town, there is a sense of the changing landscape as the sea draws closer in the south and the jagged peaks of the Outeniqua Mountains rise more and more spectacularly above the proximate landscape to the north.

Approximately 7.5km east of the site, along the N2, at the Mossel Bay turnoff, the land drops dramatically away and the bay, the mountains, the seaside villages and the water bodies that are characteristic of the Garden Route are suddenly laid out before the viewer. This view is one of the signature vistas in the area and on the Garden Route. Compared to the landscape east of this point on the N2, (the Garden Route proper), the scenic quality of the landscape west of this point, (in the vicinity of the proposed OCGT plant) is less visually stimulating although it is still a beautiful and interesting landscape.

The signature vista will not be affected in any way by the proposed development, but views along the N2 west of Mossel Bay tend to be drawn northwards to the promise of the mountains in the distance. This means that travellers tend to look to the peaks beyond, across the PetroSA site, Mossdustria, the site of the OCGT plant and the path of the transmission lines.

Although Mossel Bay and the areas to the east of Mossel Bay entertain significant tourist activity, there do not appear to be any tourist facilities in the area that will be visually affected by the development of the plant. Only tourists travelling through the area may be visually affected.

The "viewshed" refers to the theoretical outer-most extent or area from which a site can be seen. It must, however, be remembered that visibility may be obscured in reality by objects within the viewshed such as existing buildings, trees, lower ridges, outcrops and other geographical or natural features, and also by distance where an object can visually blend into its background or be completely lost to sight.

Because of the gentle slope and undulation of the land surrounding the site, there are few visual barriers that stand out from the landscape to create a natural viewshed. The ridge line to the east and west of Proteus substation and northeast of the R327 does, however, form a visual barrier to views from the north and east.

To the east, south and west of the proposed plant, the viewshed is broken by the local topography with the various elements of the proposed development sliding in and out of sight as they are viewed in relation to the local topography. In many instances the mitigation of distance will form the viewshed for specific views rather than the geographical features.

2.4 FAUNA

Due to the farming activities within the study area, indigenous terrestrial faunal diversity is restricted. However, there is evidence of various small mammals such as rodents, porcupines, and small antelope within the study area. In addition, PetroSA's nature reserve is located adjacent to the refinery, between the southern security fence and the N2 National Road. Species found with the Nature Reserve include springbok, Burchell's Zebra, grysbok and Cape hares.

An additional specialist study to address potential ecological impacts of the expansion of the plant was undertaken by Conservation Management Services (see Annexure B) and the findings of the study are reflected in Chapter 5 below.

2.5 GEOLOGY AND DRAINAGE

The study area is underlain by sandstone and shale beds of the Table Mountain and Bokkeveld Groups. North of Mossel Bay, rocks of the Enon Formation and other similar younger deposits (of Cretaceous and Tertiary age) are found. These rocks are deposited in an east to west elongated trough and are considered to extend offshore.

The Kouga Formation is the principal aquifer in the study area and its recharge area lies north of the refinery.

A minor seasonal tributary of the Blinde River, which drains to the south, has its source approximately 1 km to the south-southwest of the proposed OCGT power plant site. However, the site is particularly flat and as a consequence is not well drained. A shallow water table is likely to occur in an area approximately 800 m to the east of the proposed site, i.e. closer to the PetroSA facility. The ecological specialist study referred to in Section 2.4 above specifically also addresses the implications for the proposed additional OCGT units on the Blinde River.

2.6 CLIMATE

The study area falls within a Mediterranean-type climate with hot summers and wet winters. The annual precipitation is approximately 400-600 mm, peaking in spring and autumn. Winds are typically from the southeast during summer months, while winter frontal systems cause north and westerly winds. Strong winds with an average speed of 20 km/h are experienced during winter, whilst the average wind speed in summer is approximately 15 km/h.

The average mean temperature in summer is 25^{o}C and the average mean temperature in winter is 14^{o}C.

2.7 EXISTING INFRASTRUCTURE

The N2 National Road is located approximately 1.5 km south of the existing OCGT power plant and substation site where the additional units are proposed. The Kleinberg-Mossdustria railway line is located immediately north of the site and the R327 is located further to the north. The Proteus substation is located 10 km northwest of the proposed power plant site and two 132 kV and two 400 kV transmission lines run in a northwesterly direction from the site to the substation.

2.8 HERITAGE / CULTURAL RESOURCES

The specialist heritage assessment for the approved OCGT plant was undertaken by Tim Hart of the Archaeology Contracts Office. The information provided below was extracted from the specialist report (Archaeology Contracts Office, 2005) and additional attention to heritage impacts was not deemed necessary for the proposed expansion of the plant, as described in Chapter 5 below.

This paragraph provides an overview of archaeological knowledge of the greater Mossel Bay area, to contextualise the study area in particular. A cave at Cape St Blaize that was excavated in 1888 by Lieth (Nilssen pers com) and by Goodwin in the 1920s revealed an extensive archaeological deposit dating from 200 000 years ago (Middle Stone Age) to the relatively recent shell middens of pre-colonial San and/or Khoekhoen herders. For many years since the excavations of Cape St Blaize cave, very little archaeological research has taken place in the area until the extensive cave and rock shelters of Pinnacle Point were brought to the attention of Prof Curtis Marean (Stoneybrook University, New York and Dr Peter Nilssen (Mossel Bay Archaeological Project). A detailed program of research commenced, funded by the American National Science Foundation. This has resulted in the excavation of several sites resulting in the discovery of some very early fragmentary human remains and a complex Middle Stone Age sequence. No colonial period archaeological research has ever taken place in the area so very little is known about early colonial period settlement, apart from that which is historically recorded. In terms of the study area itself, no prior studies have taken place.

Since the study area lies in a rolling open landscape away from the coast, the expectation is that the kind of archaeological material that will be found will consist of open scatters of Early and Middle Stone Age artifacts (with rarer concentrations of later material) which tend to occur ubiquitously throughout Southern Africa. It is only when such scatters are found in association with fossil bone or in clusters of discernable density that significant impacts can occur. Since no rocky outcrops, shelters or natural foci were found during a site inspection of the study area, occurrences of Late Stone Age archaeological material are not expected to be frequent.

2.9 SOCIO-ECONOMIC ASPECTS

The specialist socio-economic assessment for the approved OCGT plant was undertaken by Alex Kempthorne of Urban Econ[9]. The information provided below has been extracted from the specialist report compiled by her (Urban-Econ, 2005) and provides relevant baseline information for the present study. An additional specialist study to address potential social impacts of the expansion of the plant (see Annexure D) was undertaken by Liezl Coetzee, a social scientist, and the findings of the study are reflected in Chapter 5 below.

The Gross Geographic Product (GGP) of the greater Mossel Bay area is the value of all the final goods and services produced within the local economy during a specific period. It is therefore an indication of the level of production and size of the local economy in the study area. The Mossel Bay economic profile is provided in Figure 5.

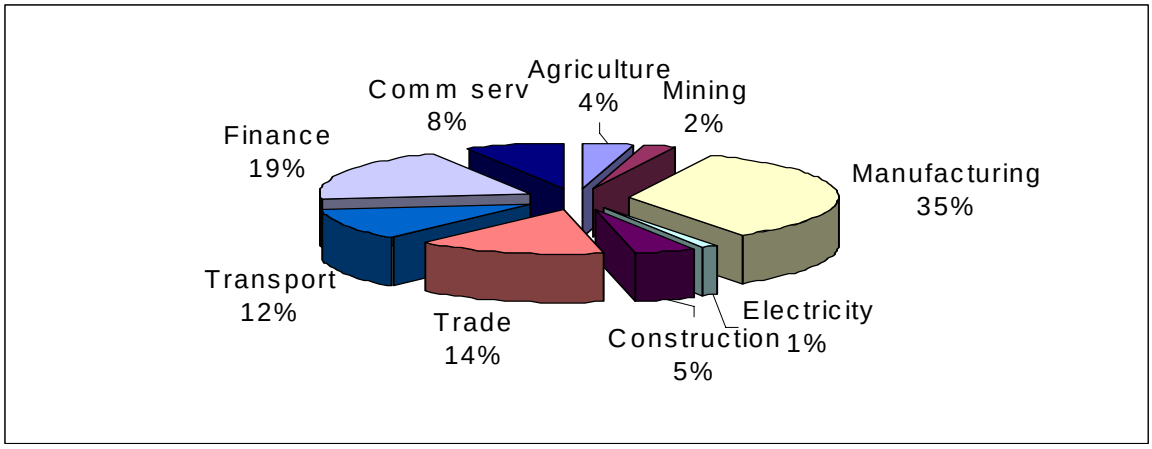

Figure 5 : Mossel Bay economic profile, current values (Source: StatsSA, 2005)

Figure 5 illustrates that the Mossel Bay economy is fairly well diversified, namely it is not concentrated in a specific sector, with the most important sector contribution being the Manufacturing Sector (35%) followed by the Finance and Community Services Sectors (8%) and the Trade Sector (14%). The Electricity Sector which consists of electricity, water and gas contributes 1%. The Mossel Bay area's economic performance is therefore not dependent on a single economic activity for its future growth and sustainability and has reduced influence from negative external factors.

The degree to which an economy is diversified can be illustrated in a terms of a Tress Index. The Tress Index is measured on a scale of 1 to 100. The higher the value of the Tress Index in an area, the more concentrated is the economy and the lower the value the more diversified the economy. The local Tress Index is 44.55, showing that the economy of Mossel Bay is more

[9] As a separate exercise to the project-level EIA documented in the EIR for the original approved OCGT plant, Eskom had also commissioned an evaluation study on the broad macroeconomic impact of the construction of the two OCGT power plants at Atlantis and Mossel Bay (Global Insight SA, 2005).

diversified than those of Knysna (49.81) and the Western Cape Province (54.75) as a whole. This is good as the majority of local economies in South Africa are struggling with concentrated economies that desperately need to be diversified. Mossel Bay, on the other hand, appears to have a healthy distribution of economic activity.

Mossel Bay has always had a very strong industrial character that was traditionally driven by the large oil storage reserves located at Voorbaai, as well as a large number of industries involved in shipbuilding and ship repair. Most of these industries are concentrated around the harbour and predominantly serve the fishing industry. Other industries are related to agro-processing (specifically milk extracts) and therefore an agglomeration of agro-industries in Mossel Bay has been developing. There are surprisingly few industries using products or by-products of the PetroSA refinery.

In addition, during recent years, the town has developed a fairly strong tourism industry. The industrial character of the town initially hampered the development of the tourism industry. However, it would appear as if the very strong tourism development in the neighbouring towns along the Eden coast, most notably George and Knysna, has now spilled over to Mossel Bay. The tourism market in Mossel Bay is mainly middle income and domestically based.

A summary of the Mossel Bay economy's main trends and dynamics is as follows:

- The primary sector of the Mossel Bay economy appears to be declining, the secondary sector is experiencing growth in its share of the economy and the tertiary sector appears to be increasing its proportionate share.
- Sectors showing strong growth in general are Building and Construction, Trade, Transport and Finance while the Manufacturing and Electricity Sectors show a slow decline. These trends are expected to continue into 2007, although future decisions for Eskom could influence growth for the Electricity Sector post 2010. The implications of this proposed growth has positive implications for the property market. The additional growth combined with the growth in the construction sector, implies that in the medium term there will be a continued growth in the property market.
- The economy of Mossel Bay is relatively well diversified. This is a good sign as the majority of local economies in South Africa are struggling with concentrated economies that desperately need to be diversified.
- The main sectors in which Mossel Bay has a comparative advantage in the region are Tourism, Construction, Utilities (electricity/gas/water), Manufacturing and Agriculture. This has further good implications for the property market as these sectors can be more fully developed.

2.10 PLANNING FRAMEWORK

The approved OCGT power plant and transmission substation site is located within PetroSA's landholding and was thus already zoned for industrial use. Formal confirmation of the industrial

zoning of the approved OCGT power plant site was obtained at the time from the Mossel Bay Municipality.

However, the proposal to install three additional turbine units at the site necessitates a westward expansion of the facility. As described in Sections 1.3 and 1.5 above, the examination of alternative positioning of the proposed additional units is subject to an exemption application. Thus, an estimated 25 hectares of the enlarged site to accommodate the additional units would extend into adjacent land presently zoned as agricultural. Rezoning and subdivision will therefore need to be pursued and this is being undertaken by Planning Partners as a separate exercise to this EIA process. The planning approval process would include the consideration of whether a regional structure plan amendment would be necessary.

Planning Partners submitted their application for subdivision to the National and Provincial Departments of Agriculture on 13 April 2007. Initial comment regarding this issue has also been elicited from the provincial department, as reflected in Annexure R.

3 DESCRIPTION OF PROJECT PROPOSAL AND POTENTIAL IMPACTS IDENTIFIED FOR DETAILED ASSESSMENT

3.1 INTRODUCTION

This chapter provides an overview of the proposed project, which, as indicated earlier, entails the addition of three 150 MW units to the OCGT power plant of three 150 MW units that is currently under construction near the PetroSA Gas to Liquid (GTL) facility near Mossel Bay. The three proposed additional units of 150 MW each will therefore result in an increase in total output of the OCGT plant of 450 MW, i.e. to a combined total output of 900 MW. Please refer to Figure 6 for a site layout plan and Figure 7 for a diagramme of a typical OCGT generating unit.

The proposed project therefore comprises the following:

- three additional gas turbine units with an output of 150 MW each;
- fuel storage facility with a total storage capacity of 5.4 million litres;
- a propane storage facility of 13 cubic metres[10];
- two conservancy tanks, each with a capacity of 6 000 litres;
- a control room;
- a fuel supply pipeline;
- a water supply pipeline; and
- an HV yard.

At this stage of the feasibility and planning process, it is likely that the fuel storage tanks would be located on the western side of the site due to local topography, and conservancy tanks would be located between the existing OCGT units and the proposed additional units. Fuel and water supply would be by means of continuations of the existing pipelines within the OCGT precinct. The extended HV yard would be located immediately north of the proposed three units and would enable the electricity generated to then be transported to the Proteus substation via the authorised and recently commissioned 400 kV transmission lines. The total area required to be subdivided and re-zoned for the proposed units and associated infrastructure is approximately 25 ha. The additional area will be incorporated into the existing OCGT power plant precinct of approximately 28 ha, resulting in a combined area of approximately 53 ha. Access would be via the access road to the existing OCGT power plant. The highest points of the plant would be the three emission stacks, likely to be about 30 m high.

In addition, this chapter describes the potential impacts that have been identified which are applicable to the construction and operational phases of the proposed project.

[10] The need for propane storage and use on site has only recently emerged and was not reflected in the preceding Scoping Report for this project. Propane is used for starting the turbine units before switching to diesel for continued operation.

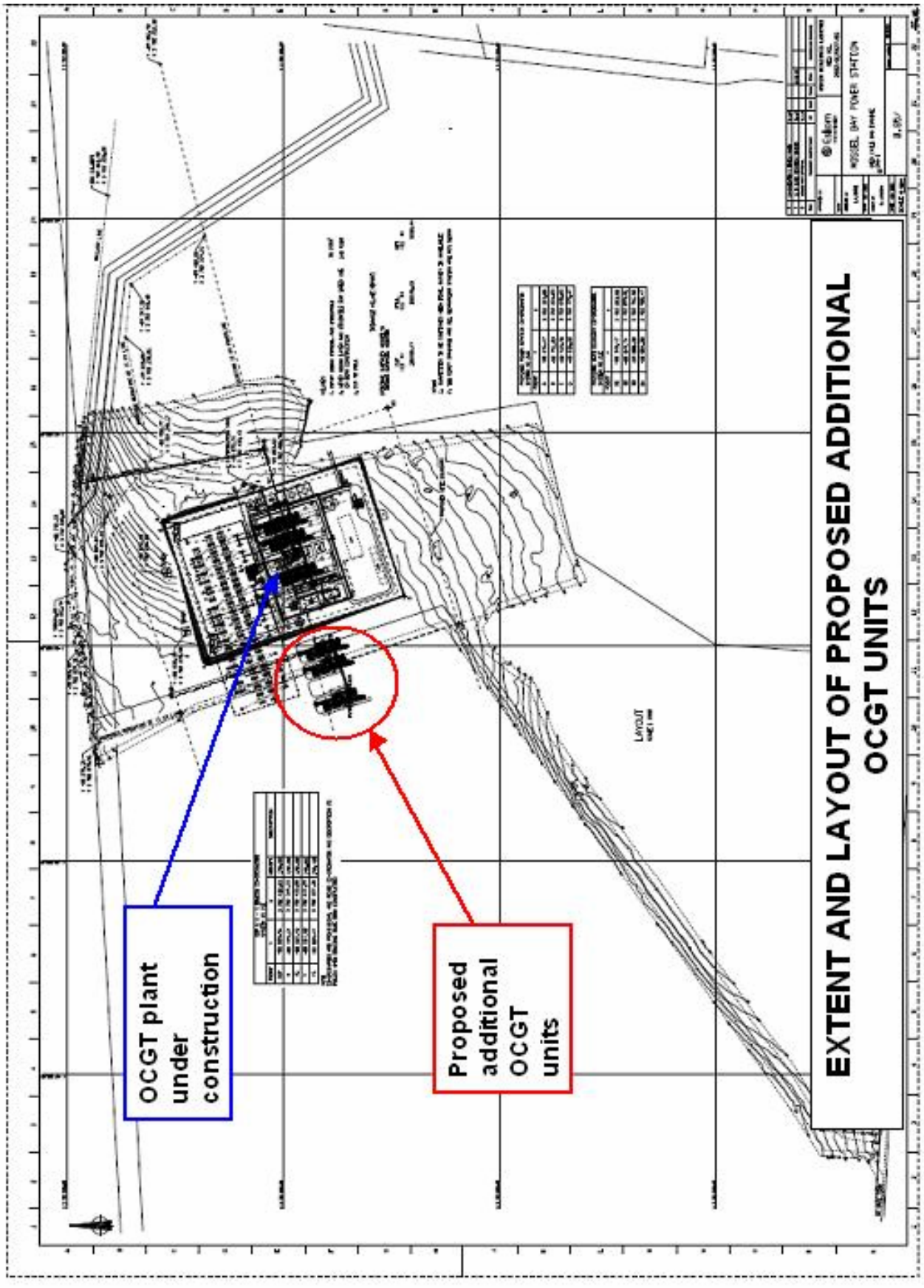

Figure 6: Site layout plan for additional OCGT units

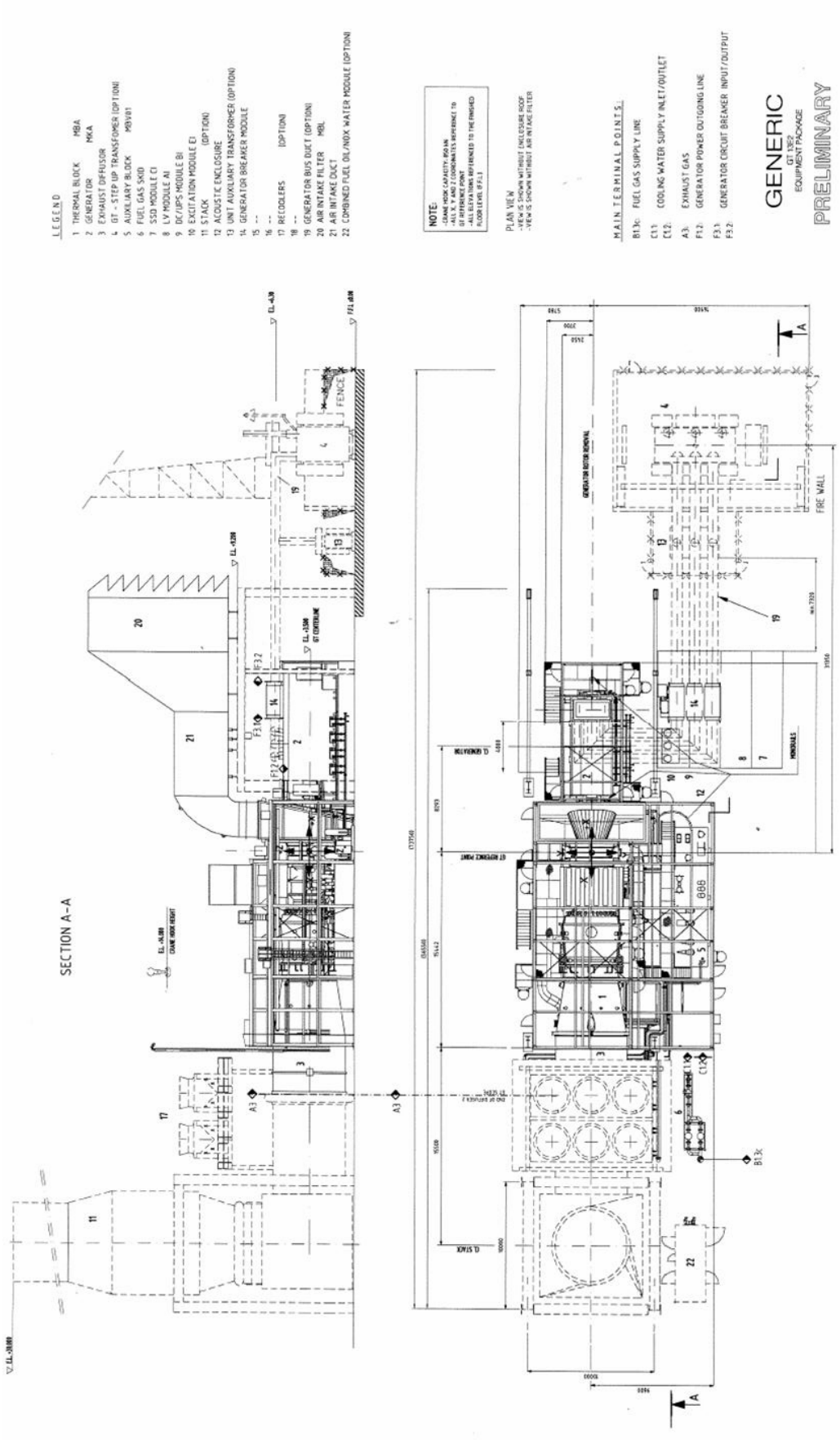

Figure 7: Typical OCGT generating unit

3.1.1 Open cycle gas turbine power plant

The OCGT power plant produces electricity by means of hot gas turning a turbine that powers a generator (see Figure 8). OCGT technology is based on the Brayton cycle which describes what happens to air as it passes through the system and specifies the relationship between the volume of air in the system and the pressure it is under.

According to the Brayton cycle, air is initially compressed, increasing its pressure as the volume of space it occupies is reduced. This compressed air is then heated at a constant pressure. Heat is added by injecting fuel into the combustor and igniting it on a continuous basis. The hot compressed air is then allowed to expand, reducing the pressure and temperature and increasing its volume. This expansion takes place within the turbine, where the expansion of the hot gasses against the turbine blades turns a shaft. This shaft extends into a generator, which produces electricity. The Brayton cycle is completed by a process where the volume of air is decreased (that is, the temperature decreases) as heat is absorbed into the atmosphere.

The units would be fuelled by a form of liquid distillate fuel (diesel) acquired from PetroSA.

It is envisaged that the proposed three additional units would operate for an average of five hours per day during weekdays - two hours in the morning and three hours during the evening. This, however, is dependent on electricity demand and system requirements. It could thus be necessary to operate in an emergency situation for longer periods of time. Such situations are possible with the current capacity constraints but would be unlikely once additional base load capacity is installed. The objective of the OCGT power plant is to provide peaking power within a relatively short time after starting the plant.

The operation of the gas turbine results in airborne particles being deposited on the compressor blades. Because soiling of the compressor results in the reduction of the thermal efficiency of the gas, the compressor blades require regular cleaning. The cleaning may occur while the plant is off-line or on-line. The cleaning is undertaken using an alkali-based[11] solvent, which will be mixed with water to form an emulsion. Effluent produced by the off-line cleaning would be drained from the compressor using a controlled process which passes through an oil separator and thereafter would be transported to the PetroSA waste disposal site that is licensed for the disposal of such material.

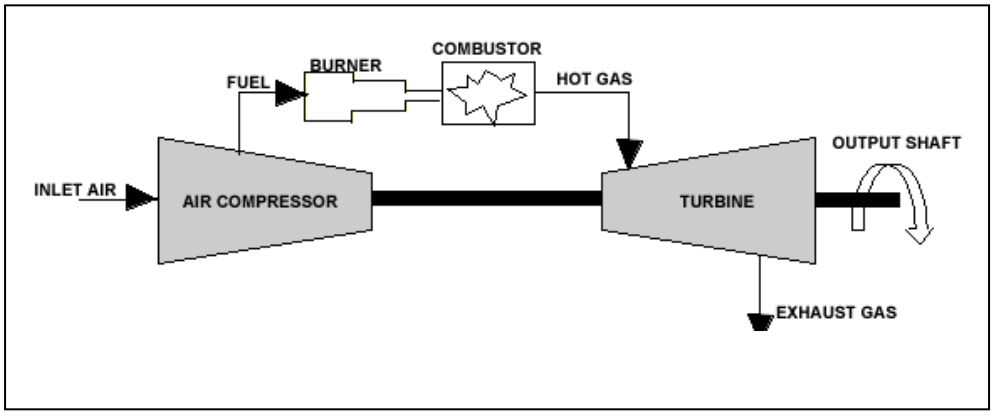

Figure 8 : Schematic of a gas turbine

Although the OCGT power plant is considered a 'clean' technology in comparison to coal-burning power stations, it produces emissions such as oxides of sulphur, oxides of nitrogen (NO_x) and greenhouse gasses e.g. carbon dioxide. The exhaust gasses of the OCGT power plant would be discharged to the atmosphere through the stacks. Two possible NO_x abatement measures were investigated for possible implementation during the EIA for the approved OCGT plant, namely:

(i) Dry NO_x Abatement Measures

Most gas turbine manufacturers offer low NO_x burners in their gas turbines. These burners limit the formation of thermal NO_x through lean and staged combustion of the fuel. When burning natural gas, these systems can achieve NO_x levels as low as 25ppm. These systems are referred to as dry low NO_x systems because they do not require water for NO_x abatement.

(ii) Wet NO_x Abatement Measures

Wet abatement refers to the injection of water or steam into the combustor to quench the flame temperature and thereby limit the formation of thermal NO_x. While all major suppliers have dry low NO_x systems for natural gas fuels, they have had varying success with dry low NO_x systems for liquid fuels such as diesel or kerosene. Therefore wet NO_x abatement is usually specified for liquid fuels.

It is estimated that approximately 87 000 kilolitres of de-mineralised water per year would be required should wet NO_x abatement measures be implemented. However, since the proposed additional units would operate under the identical conditions to the approved OCGT plant, wet NO_x technology is not being considered in this EIA process and there are thus no further implications for water use.

3.1.2 Fuel supply pipeline

PetroSA would supply the fuel for the proposed additional OCGT units via an on-site extension of the pipeline that supplies the approved OCGT plant. Approximately 40 tons (52 m^3) of liquid distillate fuel (diesel) would be required per turbine unit for each hour of operation. The proposed pipeline would be installed above the ground for maintenance and safety reasons, e.g. to detect possible leaks which would have a potential environmental impact. It would be of mild steel, 100 mm or 150 mm in diameter and designed to operate at 10 bar gauge.

[11] Note that the reference to a hydrocarbon-based solvent in earlier documentation is incorrect.

3.1.3 Transmission substation

The proposed additional units would require an extension of the approved transmission substation that occupies an area adjacent to the OCGT power plant. The purpose of the extended transmission substation is to feed the generated electricity via transformers to the transmission lines, which then carry it to the Proteus substation. The substation would consist of three 400 kV transformers with their associated infrastructure and steelwork (see Figure 6).

3.1.4 Access

It is proposed to provide road access to the site of the additional OCGT units directly from the approved OCGT plant site, i.e. no new road access is envisaged.

3.1.5 Water supply

Since water for wet NO_x abatement is no longer necessary, as described further in Sections 5.5.4 and 5.6.4 below, the proposed additional OCGT units would only require potable water for blade washing, domestic use and fire protection. The approximate volume required per month for these purposes would amount to 30 kilolitres. This equates to roughly the monthly usage of a middle-income household and would be supplied by the Mossel Bay Municipality. Written confirmation of the municipality's ability to supply this amount of water has been received and a copy of the letter is provided in Annexure E.

Effluent from blade washing would need to be disposed of appropriately. See Sections 5.5.1 and 5.5.4 below.

3.1.6 Storage tank farm

The proposed additional turbine units includes the installation of a number of storage tanks within the boundary of the extended OCGT power plant site. Given that dry NO_x abatement measures have been decided upon, the only tanks required would be:

- Liquid distillate fuel (diesel);
- Propane;
- Raw water; and
- Waste water.

3.2 POTENTIAL IMPACTS IDENTIFIED

This section outlines the potential environmental impacts identified during the Scoping phase. In particular, it distinguishes between operational phase impacts and construction phase impacts. Please refer to the preceding Scoping Report of March 2007 for a detailed account of scoped issues.

3.2.1 Operational phase impacts on the biophysical environment

The following potential operational phase impacts on the biophysical environment were identified for further investigation during the EIA phase of the process and are assessed in detail in Chapter 5 of this report:

- Impact on flora;
- Impact on fauna and avifauna;
- Impact on air quality;
- Impact on water availability;
- Effluent management issues; and
- Impact on geology and drainage.

3.2.2 Operational phase impacts on the socio-economic environment

The following potential operational phase impacts on the socio-economic environment were identified for further investigation during the EIA phase of the process and are assessed in detail in Chapter 5 of this report:

- Visual impact;
- Impact on heritage resources;
- Impact on traffic flow;
- Impact on ambient noise quality;
- Potential risks to human health;
- Impact on the existing infrastructure; and
- Impact on socio-economic conditions.

3.2.3 Construction phase impacts on the biophysical and socio economic environments

A number of negative impacts on the biophysical and socio-economic environment can possibly arise as a result of the construction phase. The potential impacts on the biophysical and socio-economic environment during the construction phase could include the following:

- Impact on flora;
- Impact on fauna;
- Erosion and land degradation;
- Noise disturbances to adjacent landowners;
- Waste and litter pollution;
- Water pollution and conservation;
- Dust management;
- Traffic and access disturbances; and
- Safety risks.

As indicated in the Scoping Report, the Project Specification Environmental Management Plan (EMP) already in place for the approved OCGT plant has been recontextualised, to regulate and minimise the impacts of the activities that may result from the construction of the additional OCGT units. Annexure F includes a draft of the Project Specification EMP for the construction phase of the proposed project.

4 THE PUBLIC PARTICIPATION PROCESS

4.1 INTRODUCTION

Public participation is an essential component of the EIA process. The process of public involvement encourages interested and affected parties (I&APs) to raise their concerns and to comment on the proposed project, during the planning, design and approval phases of the proposed development. The approach to the public participation has been informed by the NEMA EIA regulations (Regulation No.385) and the DEA&DP Guideline on Public Participation of November 2006.

4.2 PUBLIC PARTICIPATION DURING THE SCOPING PHASE

The key components of the public participation undertaken during the Scoping Phase are summarised as follows:

- A meeting with the landowners of the proposed site on 30 August 2006. The purpose of the meeting was to describe the proposed activities and to provide a consent form for the landowners to complete and sign (the completed consent form was submitted to the environmental authorities as an annexure to the Application Form).
- Placing a media notice in the local newspaper, the Mossel Bay Advertiser, on 6 October 2006. The media notice informed the public about the proposed project, invited the public to register and comment, notified the public of the lodging of the Draft Scoping Report of October 2006 in local libraries and informed them of the intention to present the Draft Scoping Report to the Environmental Liaison Committee that was established for the existing OCGT power plant. A copy of the media notice, which was published in English and Afrikaans, was provided as an annexure to the report.
- Lodging the Draft Scoping Report for public review and comment at the Mossel Bay and D'Almeida Public Libraries on 9 October 2006. In addition, the report was placed on the Eskom and Ninham Shand websites at *www.eskom.co.za/eia* and *www.ninhamshand.co.za*, respectively.
- Posting a letter to all I&APs who were registered during the previous EIA process (for the authorised OCGT power plant) to inform them of the proposed activities and of the availability of the report. A copy of the letter and a list of addressees was provided as an annexure to the Amended Scoping Report of January 2007. A copy of the Executive Summary of the Draft Scoping Report was included with the letter.
- A letter informing registered I&APs of the availability of the amendments to the Scoping Report as requested by DEA&DP, and proof of postage, was provided an annexure to the Amended Scoping Report of January 2007.
- A list of registered I&APs was provided as an annexure to the Amended Scoping Report of January 2007.

- Erecting an on-site notice in an appropriate place, giving notification of the EIA process being undertaken. As proof of the notice having been erected on site, a statement to this effect from Eskom's Client Office Site Representative (Generation Division), R Chippe and an A4 rendition of the notice were provided as annexures to the Amended Scoping Report of January 2007.
- Meeting with the existing Environmental Liaison Committee (ELC) for the OCGT power plant, to present the findings of the Draft Scoping Report and to elicit questions and comments on the proposed activities. This occurred on 12 October 2006, when a slot was provided on the agenda of a scheduled ELC meeting.
- Recording comments, queries and issues raised as well as responses thereto. A copy of the notes taken on 12 October 2006, together with the complete minutes of the ELC meeting, were provided as an annexure to the Final Scoping Report of November 2006. No other responses were received during the comment period provided.
- As indicated in the report distribution control sheet contained in the November 2006 version of the Final Scoping Report, copies were provided to other relevant organs of state. As proof, postage records were provided as an annexure to the report.
- The Final Scoping Report of November 2006 was updated in light of comments received during the public participation process and submitted to DEA&DP. It should be noted, however, that the only comments received at that time were elicited from the ELC meeting of 12 November 2006.
- DEA&DP's rejection of the Final Scoping Report and Plan of Study for EIA of November 2006 necessitated the presentation of an amended version (January 2007) to I&APs. After notifying the registered I&APs accordingly, a public meeting was held on 8 February 2007 where the amendments were presented to the public. Minutes of this meeting were provided as an annexure to the Amended Final Scoping Report of March 2007.
- Eskom had initially requested the public to submit comments within 14 days of the advertising of the amendment to the Scoping Report. However, as a result of negative comments made in this regard, this request was withdrawn (as advertised in the Mossel Bay Advertiser on 9 February 2007) and the full 30 day comment period was allowed.

The comment period on the Amended Scoping Report of January 2007 closed on 26 February 2007. In light of comments received during the last round of public engagement during the Scoping phase of the EIA process (as reflected in an Issues Trail that appeared as an annexure to the report and is included in this Final EIR as Annexure G) it was updated as the Amended Final Scoping Report of March 2007 and was submitted to DEA&DP for their consideration.

DEA&DP's acceptance of the Amended Final Scoping Report and approval of the Plan of Study for EIA was received on 13 March 2007 (see Annexure A) and allowed the assessment phase of the EIA process, as reflected in this Final EIR, to be undertaken.

4.3 PUBLIC PARTICIPATION DURING THE EIR PHASE

The public participation process undertaken during the EIR phase comprised the following:

- The Draft EIR was lodged at the Mossel Bay, D'Almeida and KwaNonqaba Public Libraries, and on the Eskom and Ninham Shand websites, at *www.eskom.co.za/eia* and *www.ninhamshand.co.za* respectively, on 22 March 2007. The commenting period closed on 23 April 2007.
- Registered I&APs were notified of the availability of the Draft EIR by means of a letter which included a copy of the Draft EIR Summary. See Annexure H.
- Media notices were placed in the Mossel Bay Advertiser on 16 March 2007 in English and Afrikaans, and 23 March 2007 in isiXhosa, in order to notify I&APs of the availability of the Draft EIR and to invite them to the third public forum. See Annexure I.
- The third pubic forum, which comprised a formal presentation and an open public meeting at the Mossel Town Hall, was held on 28 March 2007. The findings of the Draft EIR were presented and an opportunity provided for I&APs to raise concerns and comments. Minutes of the meeting have been distributed and a copy is presented in Annexure P.
- A focus group meeting with representatives of the Dana Bay Residents Association, to address their specific concerns, was also held on 28 March 2007 and minutes of the meeting have been distributed and a copy is presented in Annexure P.

The comments received during the commenting period for the Draft EIR, as well as the Issues Trail compiled in response to the comments, are presented as Annexure Q of this finalised EIR.

4.4 DECISION AND APPEAL PERIOD

This finalised EIR has been submitted to the Department of Environmental Affairs and Development Planning (DEA&DP) for their consideration. Registered I&APs will be informed of the submission by letter and a copy of the *Update Summary*, as well as copies of meeting minutes where appropriate.

Once they have considered the document and are satisfied that it provides sufficient information to make an informed decision, DEA&DP will determine the environmental acceptability of the recommended project actions and mitigatory measures. Thereafter, DEA&DP will issue a Record of Decision and any conditions of approval relative to the authorisation, should the proposed activity be approved.

Following the issuing of the Record of Decision, DEA&DP's decision will be communicated by means of letters to all identified interested and affected parties. A 30-day appeal period follows, during which interested and affected parties will have an opportunity to appeal against the decision to the Provincial Minister of Environmental Affairs and Development Planning, in terms of the National Environmental Management Act (Act No. 107 of 1998).

5 DESCRIPTION OF POTENTIAL IMPACTS AND POSSIBLE MITIGATION MEASURES

5.1 INTRODUCTION

This chapter provides a detailed description of the potential impacts which may occur as a result of the implementation of the proposed project described in Chapter 2. These impacts have been subject to a detailed assessment and include potential biophysical and social impacts which may arise during the operational phase of the proposed activities (long-term), as well as potential construction-related impacts (short-term). The array of specialist studies commissioned for this EIA provide the source material for the evaluation reflected in this section of the Draft EIR, *viz*.:

- Ecological study ~ Annexure B
- Visual impact assessment ~ Annexure C
- Social study ~ Annexure D
- Risk assessment ~ Annexure K
- Noise study ~ Annexure M
- Air quality study ~ Annexure L

5.2 ASSESSMENT METHODOLOGY

For each of the potential impacts, the EXTENT (spatial scale), MAGNITUDE (severity) and DURATION (time scale) were assessed. These criteria were used to ascertain the significance of the impact, firstly in the case of no mitigation and then with mitigation measures in place. The tables below show the rating scale used to assess these variables, and defines each of the rating categories.

Table 5.1 : Assessment criteria for the evaluation of impacts

CRITERIA	CATEGORY	DESCRIPTION
Extent or spatial influence of impact	**Regional**	Beyond a 7 km radius of the OCGT power plant and associated infrastructure
	Local	Within a 7 km radius of the OCGT power plant and associated infrastructure
	Site specific	On site or within 100 m of the OCGT power plant and associated infrastructure
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 18 months
	Medium Term	0-10 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 combining these factors to arrive at the different significance ratings is explained in Table 5.2.

Table 5.2 : 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, are estimated using the rating systems outlined in Tables 5.3 and 5.4 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 outline in Table 5.5.

Table 5.3 : Definition of probability ratings

PROBABILITY RATINGS	CRITERIA
Definite	Estimated greater than 95 % chance of the impact occurring.
Highly probable	Estimated 80 to 95 % chance of the impact occurring.
Probable	Estimated 20 to 80 % chance of the impact occurring.
Possible	Estimated 5 to 20 % chance of the impact occurring.
Unlikely	Estimated less than 5 % chance of the impact occurring.

Table 5.4 : 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 5.5 : Definition of reversibility ratings

REVERSIBILITY RATINGS	CRITERIA
Irreversible	The activity will lead to an impact that is permanent.
Partially reversible	The impact is reversible to a degree e.g. acceptable revegetation measures can be implemented but the pre-impact species composition and/or diversity may never be attained. Impacts may be partially reversible within a short (during construction), medium (during operation) or long term (following decommissioning) timeframe.
Fully reversible	The impact is fully reversible, within a short, medium or long term timeframe.

The following abbreviations are used:

Mit = Mitigation	No Mit = Without mitigation	S = short	(+) = Positive	V = Very
Sig = Significance	Partial = Partially reversible	L = long	(-) = Negative	Med = Medium

A summary of the significance of the potential impacts is presented in the final chapter, Table 6.1 in Chapter 6.

5.3 SUBJECTIVITY IN ASSIGNING SIGNIFICANCE

Despite attempts at providing a completely objective and impartial assessment of the environmental implications of development activities, EIA processes can never escape the subjectivity inherent in attempting to define significance. The determination of the significance of an impact depends on both the context (spatial scale and temporal duration) and intensity or magnitude of that impact. Since the observer will ultimately prejudice the rationalisation of context and intensity, there can be no wholly objective measure by which to judge significance.

This notwithstanding, it is an inescapable reality that to facilitate informed decision-making, EIAs must endeavour to come to terms with the significance of the potential environmental impacts associated with particular development activities. Recognising this, we have attempted to address potential subjectivity in the current process as follows:

- Being explicit about the difficulty of being completely objective in the determination of significance, as outlined above;
- Developing an explicit methodology for assigning significance to impacts and outlining this methodology in detail in the Plan of Study and in this EIR. Having an explicit methodology not only forces the assessor to come to terms with the various facets contributing towards the determination of significance, thereby avoiding arbitrary assignment, but also provides the reader of the EIR with a clear summary of how the assessor derived the assigned significance;
- Wherever possible, differentiating between the likely significance of potential environmental impacts as experienced by the various affected parties; and
- Utilising a team approach to the assessment and internal review to facilitate a rigorous and defendable system.

Although these measures may not totally eliminate subjectivity, they provide an explicit context within which to review the assessment of impacts.

5.4 CONSIDERATION OF CUMULATIVE IMPACTS

Section 24(7) of the National Environmental Management Act requires the consideration of cumulative impacts as part of any environmental assessment process. EIAs have traditionally, however, failed to come to terms with such impacts, largely as a result of the following considerations:

- Cumulative effects may be local, regional or global in scale and dealing with such impacts requires co-ordinated institutional arrangements; and

- EIAs are typically carried out on specific developments, whereas cumulative impacts may result from broader biophysical, social and economic considerations, which typically cannot be addressed at the project level.

In this assessment and evaluation, cumulative effects are considered as far as possible by including the baseline status derived from the EIA undertaken for the approved OCGT plant in the determination of impacts. Specialists were specifically tasked to consider cumulative impacts as far as possible in their studies, per the Terms of Reference that appeared in the Plan of Study for EIA in the Scoping Report of March 2007.

5.5 SCREENED IMPACTS

The following impacts are anticipated to be of sufficiently low significance to be excluded from detailed assessment:

5.5.1 Impact of effluent on the receiving environment[12]

The effluent associated with blade washing (see Section 3), would also need to be disposed of appropriately. If effluent is not disposed of appropriately, water and soil contamination could occur. In terms of a services contract between Eskom and PetroSA, the adjacent PetroSA waste handling site will be used for the additional effluent discussed above. Provided that the limits set by PetroSA's license from DWAF for the operation of their effluent management system are not exceeded, this impact may be considered to be negligible.

5.5.2 Traffic

Access to the OCGT site was finalised during the previous EIA process, during which attention was drawn to various traffic problems experienced by local residents in the Mossel Bay area. The traffic impact assessment found that, even during the construction phase, the increase in traffic would not be sufficiently significant to warrant mitigation measures. In an opinion presented by a transportation specialist from Ninham Shand (see Annexure J) it was stated that the additional three OCGT units would also not significantly increase traffic volumes, even during the construction phase. Further, the intersection at Dana Bay has since been upgraded with traffic lights and I&APs report that the situation has improved (see I&AP comments on the Scoping Report – Annexure R of the Amended Final Scoping Report).

The traffic mitigation measures recommended in the previous EIA for the construction phase should still apply, namely:

[12] Note that wet NO_x abatement measures were rejected during the previous application.

"*During the construction of the plant and transmission substation, warning signs notifying road-users of trucks should be erected in advance of the access.*

Superloads will require escort vehicles while in transit, and these should assist in facilitating traffic management at the intersection while vehicles enter or exit the access."[13]

5.5.3 Heritage

The previous EIA process determined that the area likely to be affected by the OCGT power plant does not have any surface evidence of significant archaeological material. No significant impacts are therefore envisaged.

It must be noted that the general sense of place of the study area is seen as a mix of heavy industrial (the presence of PetroSA and its associated infrastructure) and agricultural activity, with transmission lines already in existence in the study area. The addition of this project into this landscape is not considered as inserting a completely new set of activities into the study area.

With reference to the possible impact on heritage resources in the area, the previous EIA process determined that the significance of the impact is considered as **low.** Heritage Western Cape have been informed of this proposed development (See Annexure L of the Amended Final Scoping Report) and, being registered I&APs, they have had sight of, and opportunity to comment on, the Draft EIR. See Annexure R.

Notwithstanding the above, it is nevertheless recommended that:

A suitably qualified archaeologist should be appointed to inspect the excavated areas at the OCGT plant prior to construction starting.

5.5.4 Water Availability

During the previous EIA process it was determined that air emission levels could be kept within prescribed standards without resorting to wet NO_X abatement. This has also been confirmed for the additional proposed units and in continuing with dry NO_x abatement, minimal water, i.e. only for turbine blade washing, fire prevention measures and domestic use, will be required for the operation of the plant. Mossel Bay Municipality have confirmed in writing that they can supply the approximately 30 kilolitres of potable water per month required for this purpose (see Annexure E).

[13] Permits for the transportation of abnormal loads would have to be obtained as required.

5.5.5 Impact on existing infrastructure

There is no known infrastructure existing on the site envisaged for the additional OCGT units and substation and therefore this potential impact will not be assessed further in this EIA.

5.5.6 Risk to human health

Two hazardous materials that present flammable thermal risks to human health are proposed to be stored and utilised on the OCGT plant site, *viz*. diesel with a storage capacity of 5.4 million litres, and propane gas with a storage capacity of 13m^3. Protection-based zones for flammable hazards were examined (see Annexure K) for each material, based on worst-case catastrophic releases. For diesel, this risk is projected to be a one in a million year frequency and for propane, a one in 1.56 million year frequency. No sensitive land uses are in proximity to the proposed site and possible impact in this regard is considered negligible. See Annexure R for relevant authority comment.

Recommendations made in the specialist risk study are that:

> *No further attention to human health is required at this time, although registration of the facility as a Major Hazard Installation should be pursued.*

5.6 IMPACTS OF THE PROPOSED DEVELOPMENT ON THE BIOPHYSICAL ENVIRONMENT

The following impacts are addressed in this section and the assessment is summarised in Table 6.1:

- Impact on flora;
- Impact on fauna;
- Impact on avifauna;
- Impact on air quality;
- Impact on geology and drainage.

5.6.1 Impact on flora

Potential impacts

The site is located on old agricultural lands adjacent to the already authorised three OCGT units in the northwestern corner of the PetroSA landholding, and will cover an additional area of approximately 25 ha . Topographically the area is relatively flat although a low watershed lies along the northern edge of the site, with most of the drainage of water off the study area being to the south. See Annexure B.

There are remnant patches of untransformed natural vegetation in the area that contain Red Data plant species, although the placement of the OCGT units will not be on or adjacent to these. These patches have a moderate to very high local and regional conservation value and development of any kind may destroy, disrupt or indirectly impact n these sensitive patches.

Discussion

As the entire extent of the site will be located outside of the identified botanically sensitive areas, the significance of the impact is considered as **low**. There will be no loss of natural vegetation, only a reduction of transformed agricultural land.

The connectivity between the botanically sensitive areas is important for ecological services such as pollination, dispersion and genetic interchange. Farming activities have already impacted on this connectivity and the only existing corridors are the unploughed fence-line belts. The additional units of the OCGT will not remove these corridors, but will replace them with new fence-line belts around the boundary which, over time, will replicate these corridors for ecological services.

Recommendations

- Ensure that no Category 1 invasive alien plant species as per the Conservation of Agricultural Resources Act (No 43 of 1983) regulations are used for landscaping.
- All areas of natural vegetation within the area controlled by Eskom should be cleared of alien invasive plant species according to best environmental practice.

Table 5.6 : Impact table summarising the significance of the impact on flora

(Note: the "without mitigation" option is not relevant, given the confirmed location of the proposed development.)

	OCGT Plant and Substation site	
	Without mtg	With mtg
Extent	N/A	Site specific
Magnitude	N/A	Very Low
Duration	N/A	Long term
Significance	N/A	**Low**
Probability	N/A	Definite
Confidence	N/A	Sure
Reversibility	N/A	Partially reversible

5.6.2 Impact on fauna

Potential impacts

Important micro-habitats for small fauna, such as stone piles, fence-line shrub clumps, grass cover and fence post raptor perches, may be lost due to the extension of the OCGT units. These habitats, which occur in the unploughed fence-line areas, are important for biodiversity. See Annexure B.

Discussion

The common padloper tortoise (regionally endemic species listed as a Cites Appendix 11 species) does occur in the area but its habitat consists of remnant renosterveld patches, which will not be impacted on by the proposed extension. The African mole rat, although a narrow habitat specialist, will not be significantly impacted on because extensive continuous suitable habitat is available throughout the coastal plain landscape. The impact on fauna is expected to be **very low**.

Recommendations for mitigation

- Micro-habitats created by vegetation clumps will re-establish naturally and quickly along the new outer boundary of the additional OCGT units.
- Small raptor perches will be established along the boundary fence as fence poles which birds can use for resting, spotting and feeding.
- Local indigenous shrubs and grasses can be established along the fence-line.
- The single stone pile that will be affected can be moved to an appropriate position along the new fence line.
- If the new fence is not suitable for perching raptors then wood poles can be planted adjacent to the fence.

Table 5.7 : Impact table summarising the significance, both with and without mitigation, of the impact on fauna

	OCGT Plant and Substation site	
	Without mtg	With mtg
Extent	Site specific	Site specific
Magnitude	Low	Very low
Duration	Long term	Long term
Significance	**Low**	**Very low**
Probability	Definite	Definite
Confidence	Sure	Sure
Reversibility	Partially reversible	Partially reversible

5.6.3 Impact on avifauna

Potential impacts

Three Red Data-listed bird species do occur in the general area, namely; Stanley's bustard, the blue crane and the black harrier. See Annexure B.

Discussion

These bird populations will not be significantly impacted on by the additional OCGT units as only wheatland habitat will be impacted on which is a secondary habitat for these birds. Further, extensive areas of wheatland will remain around the site, which on its own is too small to sustain even a single individual of any of these species. The OCGT site will possibly displace overland connectivity by avifauna, but they can continue on and around it. No known "flyway" or other important known migratory route will be disrupted by the additional OCGT units.

Table 5.8 : Impact table summarising the significance of the impact on avifauna

(Note: the "without mitigation" option is not relevant, given the mobility of the species concerned.)

	OCGT Plant and Substation site	
	Without mtg	With mtg
Extent	N/A	Local
Magnitude	N/A	Very Low
Duration	N/A	Long term
Significance	N/A	**Very Low**
Probability	N/A	Possible
Confidence	N/A	Sure
Reversibility	N/A	Partially reversible

5.6.4 Impact on air quality

Potential impacts

An OCGT power plant produces and releases into the atmosphere a number of gaseous and particulate emissions, such as sulphur dioxide (SO_2), nitrogen oxides (NO_x), carbon monoxide (CO), nitrogen dioxide (NO_2), fugitive volatile organic compounds, greenhouse gases and inhalable particulates (PM10). In addition, heat is emitted from the OCGT power plant via the hot exhaust gasses. See Annexure L.

The impact that the additional OCGT units would have on the surrounding air quality was determined by undertaking air dispersion simulations using the following scenarios:

Scenario 1: Plant operating 2 hours per day with NO_x = 165 mg/Nm^3, CO = 31.25 mg/Nm^3, PM10 = 50 mg/Nm^3 and SO_2 = 10.45 g/s;
Scenario 2[14]: Plant operating 2 hours per day with NO_x = 600 mg/Nm^3;
Scenario 3: Plant operating 6 hours per day with NO_x = 165 mg/Nm^3, CO = 31.25 mg/Nm^3, PM10 = 50 mg/Nm^3 and SO_2 = 10.45 g/s;
Scenario 4: Plant operating 6 hours per day with NO_x = 600 mg/Nm^3.

The assessment was undertaken using the assumptions that when the three turbines operate for two hours per day, it would be between 6 am - 7 am and 6 pm - 7 pm; and for six hours per day between 6 am - 9 am and 6 pm - 9 pm. An assumption was also made that all the NOx emitted would be converted to NO_2, i.e. a conservative approach was adopted.

The assessment was undertaken by looking at the average highest daily and hourly as well as the annual average guidelines for each applicable emission. The appendix of the air quality specialist report in Annexure L illustrates the results of the dispersion simulation for each scenario.

With reference to SO_2, the predicted concentrations did not exceed the European Community hourly guideline (350µg/m^3) or the SA daily and annual standards of 125µg/m^3 and 50µg/m^3 respectively. Although the power station is still the main contributor of SO_2 and the predicted concentrations for all six units are twice the concentration predicted for the initial three units, the predicted ground level concentration for the highest hourly period is only 1% of the EC limit.

In terms of the impact of PM10, the predicted cumulative concentrations are the same as those predicted for the baseline conditions, recognising that the largest contributor to PM10 emission is the PetroSA refinery. The Eskom power station would contribute 7% to the predicted cumulative annual average ground level concentrations for operating 2 hours per day, and 17% for operating 6 hours per day. As for SO_2, the predicted concentrations from six hours operation per day of PM10 for all six units are twice the concentration predicted for the initial three units, i.e. 0.5µg/m^3 for the highest daily concentration and 0.03µg/m^3 for the cumulative annual average. These cumulative concentrations are well below the South African National Standards (SANS) limits for both daily and annual average periods.

With reference to the impact of NO_2 at 165 mg/Nm^3, the predicted cumulative concentrations are the same as for the baseline conditions, with the PetroSA refinery contributing the major proportion of the cumulative impact. Predicted ground level concentrations at the OCGT for the highest daily and annual averaging periods are less than 1% of the SANS limit while that for the

[14] Scenarios 2 and 4 reflect the worst-case NO_x emission situation, i.e. where no NO_x controls are instituted and the other parameters remain unchanged. These scenarios were used as a comparative basis only, since Eskom is committed to installing dry low NO_x burners.

highest hourly averaging period was 14% of the prescribed limit. As far as the impact of NO_2 at 600 mg/Nm^3 is concerned, the predicted ground level concentration for the highest hourly averaging period was 50% of the prescribed limit. The OCGT plant would contribute 4% of the predicted cumulative annual average ground level concentration for the six hour scenario. Predicted concentrations for all six units are twice the concentration predicted for the initial three units.

In terms of the impact of CO, the highest predicted hourly CO concentration is 5.6 µg/m^3 at the OCGT plant and 75 µg/m3 for the cumulative scenario. This represents less than 1% of the SANS limit and is thus an insignificant contribution.

The highest predicted diesel concentration from fugitive emissions of volatile organic compounds is 700µg/m^3 which is 9% of a standard applied in Ontario in Canada. Using this standard, the highest predicted daily concentration is approximately 4% of the standard.

The proposed OCGT plant would produce 123 tons of CO_2 per unit for each hour of operation. South Africa produces approximately 365 million metric tons of CO_2 per annum. Depending on operational conditions, the proposed OCGT plant would contribute between 0.15% and 0.44% of the country's total CO_2 emission.

Discussion

Given that the OCGT plant would cumulatively not exceed any of the prescribed limits, as described above, the impact of emissions on air quality under normal operating conditions is therefore considered as **low** in significance. See Annexure R for relevant authority comment.

Recommendations

It is recommended that once the power station is operational the emissions concentrations for NO_2 be verified. The monitoring required to verify the emissions could be undertaken in collaboration with the local authority and PetroSA.

If operating periods increase above the six hours per day used in the air quality predictions, additional simulations would need to be performed.

Table 5.7 : Impact table summarising the significance of the impact of the OCGT power plant on surrounding air quality

(Note: the "without mitigation" option is not relevant, given that the most appropriate technology for minimising air emissions has been adopted by Eskom.)

	OCGT Plant and Substation site	
	Without mtg	With mtg
Extent	N/A	Regional
Magnitude	N/A	Low
Duration	N/A	Medium term
Significance	N/A	**Low**
Probability	N/A	Definite
Confidence	N/A	Certain
Reversibility	N/A	Irreversible

5.6.5 Geology and drainage

Potential impacts

This section deals specifically with runoff resulting from the drainage of the site. Due to the fact that the proposed expansion of the OCGT plant would introduce additional hardened surfaces into the landscape, runoff would need to be properly managed. A concern had been expressed by an I&AP during the Scoping phase of the EIA that the expanded OCGT site would disrupt runoff patterns and cause pollution and other impacts to the Blinde River.

Discussion

The specialist ecological study (Annexure B) examined the implication to the Blinde River in particular and made reference to the runoff treatment system presently in place for the approved OCGT plant site. Provided that suitable mitigation measures to manage runoff are designed into the system, this impact is likely to be negligible, also given the flat gradient, soil characteristics and nature of the local rainfall patterns.

Recommendations for mitigation

- Hard surface runoff from the expanded OCGT site should be channelled into the runoff treatment system already in place for the approved OCGT plant, which should be expanded accordingly if necessary.
- Pollutants, e.g. from blade washing, should be managed by means of a purpose-designed containment and disposal system that matches the system already in place for the approved OCGT plant that is presently nearing completion.

Table 5.8 : Impact table summarising the significance, both with and without mitigation, of the impact of runoff on drainage lines

	OCGT Plant and Substation site	
	Without mtg	With mtg
Extent	Regional	Site specific
Magnitude	Medium	Very low
Duration	Medium term	Medium term
Significance	**Medium**	**Very low**
Probability	Possible	Possible
Confidence	Sure	Sure
Reversibility	Partially reversible	Partially reversible

5.7 IMPACT OF THE PROPOSED DEVELOPMENT ON THE SOCIAL ENVIRONMENT

The following impacts are addressed in this section and the assessment is summarised in Table 6.1:

- Visual impact;
- Impact on ambient noise quality; and
- Impact on socio-economic conditions.

5.7.1 Visual impacts

Potential impacts

The specialist tasked with assessing the visual impact of three additional OCGT units (Annexure C) used the 2005 DEA&DP *Guideline for Involving Visual & Aesthetic Specialists in EIA Processes* (CSIR Report No ENV-S-C), together with baseline reference to the visual impact specialist study undertaken for the approved OCGT plant. Six observation points were identified and evaluated. Besides confirming the main visual impact being from the N2 national road while heading east, another key observation point was identified from the Vleesbaai road as it approaches the N2.

Discussion

While high visibility, exposure and receptor sensitivity were recorded, visual sensitivity, absorption capacity and intrusion were considered moderate. In summary, the significance of

the visual impact of the additional OCGT units is considered as **medium**, provided that mitigation measures are successfully implemented.

Recommendations for mitigation

Given that the significance of visual impact has been determined post-mitigation to be **medium**, the detailed recommendations provided during the previous assessment undertaken by CNdV Africa in 2005 are repeated here:

Siting and Earthworks

- The structures should be sited as close to the PetroSA plant as possible. The sense of there being a 'gap' between the two developments should be minimised and any shielding capabilities of the landfill site to the south must be utilised, insofar the engineering design of the proposed additional units allows it.
- The natural vegetation in the northeastern corner of the site and along the railway line should be maintained.
- The natural tree line along the railway line should be retained as it provides a certain amount of shielding from the north.
- If it is geotechnically and financially feasible the platform within the security fencing should be levelled predominantly by means of cut, rather than by balancing both cut and fill. The excess fill should then be used to create large berms thus enclosing much of the site
- Berms should be created on the southeast and southwest boundaries as this is the direction from which the plant will be most visible along the N2. The existing tree line along the railway line must be retained and will provide a certain amount of shielding from the north
- The berms should undulate and meander within the buffer zone creating a natural feel rather than an engineered one.
- The slopes of berms should not exceed 1:4 so that erosion is minimised, the planting can easily take hold, and the appearance of 'natural' slopes be emphasised.
- A landscape architect should be appointed to work with the engineers in creating an affordable but natural looking environment.

Finishes and Textures

- To a large extent the finishes and textures used at the plant will be determined by the engineering requirements of the project.
- If painted surfaces are to be used, then muted earth tones or in the case of large surfaces such as roofs, storage tanks and the stacks, medium grey tones should be selected for their ability to blend into the background. Bright colours should not to be used except for the safety markings as required by the industry.
- The fuel and other pipelines are to be painted grey unless set in a trench in which case muted colours can be used.
- The use of face brick should be avoided.
- Glass surfaces should be shielded to avoid glare and reflections.

Visual Screening of the Structures

- The berms are to be planted with indigenous fynbos species and grasses so as to minimise the need for irrigation and maintenance.
- Trees are to be planted where possible, the top and slopes of the berms being ideal for maximum screening capacity.
- Either groups of trees can be used or new tree lines created in imitation of those in the existing landscape.
- Although it would be preferable to use indigenous species, gums and other exotic trees found locally have become part of the cultural landscape and can be considered if they are not invasive.
- Landscaping should be undertaken in a manner that blends in with the surrounding environment.

Lighting

- All lighting should be kept to a minimum within the requirements of safety and efficiency.
- Where such lighting is deemed necessary, low-level lighting, which is shielded to reduce light spillage and pollution, should be used.
- No external up-lighting of any parts of the structures, including the stacks should be allowed.
- Down-lighters should be used as external lighting and shielded in such a way as to minimise light spillage and pollution beyond the extent of the area that needs to be lit.
- Security and perimeter lighting should also be shielded so that no light falls outside the area needing to be lit. Overly tall light poles are to be avoided.

Fencing

- Fencing must be visually permeable and in a medium to dark grey colour. The use of razor wire should be avoided. Electrification and isolators to be in matching colour.
- The fencing should be shielded by the berms, or failing that, by screen planting along, but away from the fence so as not to allow breaches in security.

Signage

- No backlit or neon signage is to be allowed.
- All necessary signage should be limited in size, and its colours and finishes should be chosen for their appropriateness to the colours of the site and its semi-rural nature. The use of corporate colours and logos is excluded from this.

Required Infrastructure

- All infrastructure is to be designed to have as little visual impact as possible.

Table 5.9 : Impact table summarising the significance, both with and without mitigation, of the visual impact of the proposed development

	OCGT Plant and Substation site	
	Without mtg	With mtg
Extent	Regional	Regional
Magnitude	Medium	Low
Duration	Long term	Long term
Significance	**High**	**Medium**
Probability	Probable	Possible
Confidence	Sure	Sure
Reversibility	Reversible	Reversible

5.7.2 Impact on ambient noise quality

Potential impacts

The control of noise in the Western Cape is legislated by means of the Noise Control Regulations of the Environment Conservation Act (No. 73 of 1989), per Provincial Gazette No. 5309 of 20 November 1998. Under these regulations, rural environments are considered as sensitive from a noise impact perspective. Based on the South African National Standards (SANS) documentation, the specialist noise impact assessment was undertaken using the methodology described in SANS 10328 and uses the rating tables in SANS 10103 to evaluate the impacts. See Annexure M.

Figure 9 presents the calculated noise contours for the cumulative operation, i.e. of all six units, for five hours per day during daytime. This is regarded as the most typical scenario.

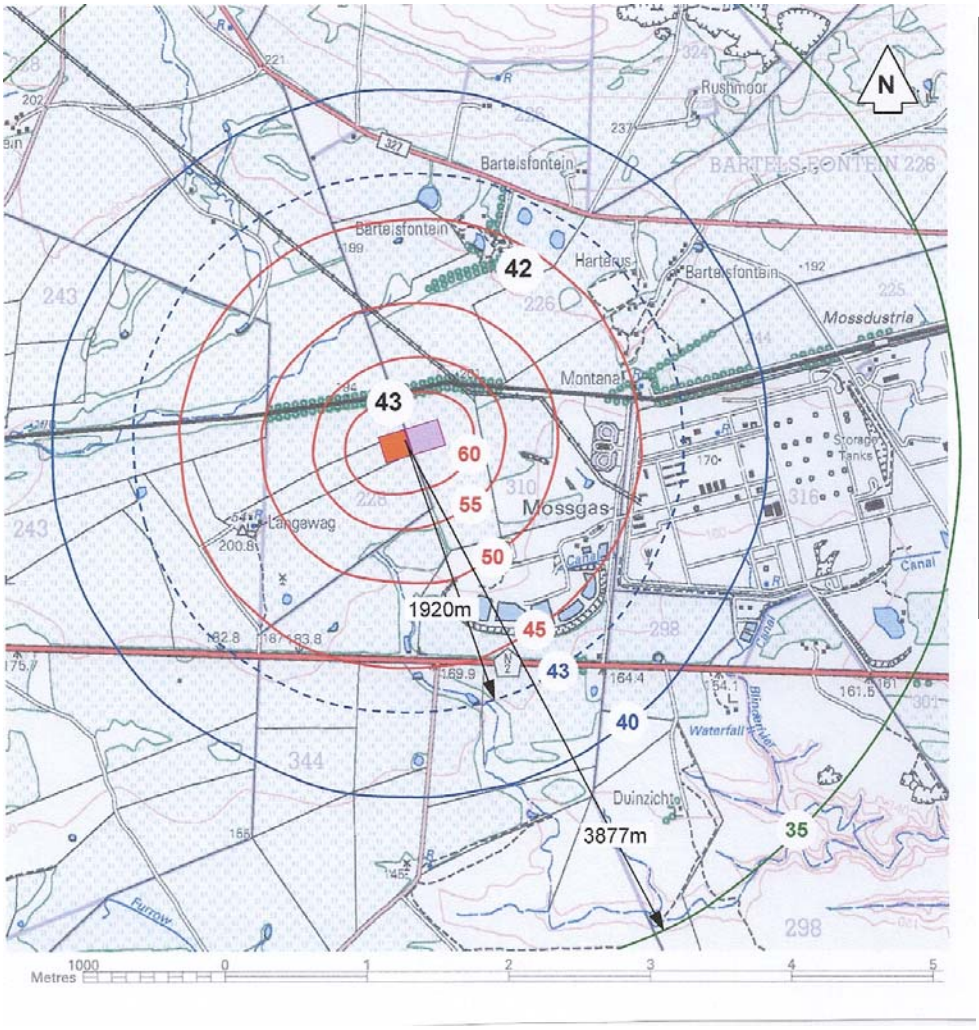

Figure 9: Calculated noise contours

Discussion

For normal daytime operation of six units for five hours out of the 16 daytime hours, noise is expected to exceed the measured ambient level of 43dBA within a distance of 1920m from the centre of the combined OCGT plant installation. This area includes the farming areas up to the R327 in the north, Montana and the residences at Harterus to the northeast and to Langewag to the southwest. At these locations, noise intensity would be expected to be between **negligible** and **low**. However, near the boundaries of the OCGT plant, this intensity would range between medium and very high. Note that when all six units are operated continuously, the measured ambient level of 43dBA would occur up to a distance of 3000m from the centre of the combined OCGT plant installation. This would result in a high intensity of noise at Montana and Harterus, and to a very high intensity at Langewag and Bartelsfontein. See Annexure R for relevant authority comment.

Mitigation

Noise mitigation of the predominant source, i.e. the outlets of the exhaust stacks, is impractical. Therefore, the units should not be operated for longer periods than those envisaged by Eskom,

i.e. five hours per day on weekdays, to remain within acceptable noise impact standards. While acknowledging the exceedances in noise intensity at the boundary of the proposed expanded OCGT site, the affected residences are at some distance from such boundaries and would be less intensely impacted on by noise.

Table 5.10 : Impact table summarising the significance, both with and without mitigation[15], of the noise impacts of the OCGT power plant

	OCGT Plant and Substation site	
	Without mtg	With mtg
Extent	Local	Local
Magnitude	High to very high	Negligible to low
Duration	Long term	Long term
Significance	**High**	**Low**
Probability	Definite	Definite
Confidence	Certain	Certain
Reversibility	Fully reversible	Fully reversible

5.7.3 Impact on socio-economic conditions

Potential impacts

The specialist social impact study (Annexure D) commissioned for the proposed additional OCGT units summarised the positive impacts of electricity provision and corporate social responsibility as potentially high and medium respectively (dependent on mitigation), while employment creation, business opportunity and skills development rated positively between insignificant and low. Insofar negative ratings are concerned, high impacts without mitigation were recorded for labourer and job seeker influx, and social conflict. Mitigation would bring these impacts down to an insignificant level.

Discussion

While the proposed additional OCGT units would provide a much needed increase in peaking generation capacity, unintended social impacts can result. Acknowledging that potential positive impacts related to job creation, business opportunity and skills development can result, although limited in extent, it must be recognised that severe socio-economic disparities persist among surrounding communities and this contributes to increased sensitivity and negative perceptions of the benefits of the proposed developments. The efforts initiated by Eskom should thus be further pursued, to maximise the potential benefits through emphasising local involvement. Eskom's commitment to corporate social investment can make an important

[15] Mitigation taken to mean limiting operation to five hours daytime operation of six units during weekdays, and intensity measured at residences and not at the OCGT site boundary.

contribution to improving the local social environment, particularly through affording attention to consultation with local communities. The establishment of a Stakeholder Forum, as a task distinct from the present EA process, can go a long way towards addressing the issue of negative socio-economic perceptions related to the proposed expansion of the OCGT plant. There is nevertheless an overall positive socio-economic benefit that should be derived from the realisation of the proposed additional units.

Potential Mitigation

- The Stakeholder Forum should be further developed insofar its composition and functioning are concerned.
- Information derived from reporting and monitoring should be easily accessible.
- A local stakeholder facilitator should be appointed to assist the project manager.
- Partnerships should be sought to pursue local social investment.

Table 5.11: Impact table summarising the significance, both with and without mitigation, of the socio-economic impact of the proposed development

	OCGT Plant and Substation site	
	Without mtg	With mtg
Extent	Regional	Regional
Magnitude	Medium	Medium positive
Duration	Medium term	Medium term
Significance	**Medium**	**Medium positive**
Probability	Highly probable	Highly probable
Confidence	Sure	Sure
Reversibility	N/A	N/A

5.8 CONSTRUCTION PHASE IMPACTS ON THE BIOPHYSICAL AND SOCIAL ENVIRONMENTS

The following impacts are of importance to the construction phase of the proposed development and the assessment is summarised in Table 6.1:

- Impact on flora;
- Impact on heritage resources;

- Visual impact;
- Impact on noise levels;
- Water and soil pollution;
- Impact on socio-economic conditions[16]; and
- Traffic and access.

The possible impacts on flora, heritage resources, visual aesthetics, socio-economic conditions and traffic impacts are not assessed below as they have been addressed in detail in Sections 5.5, 5.6 and 5.7.

5.9 CONSTRUCTION PHASE IMPACTS ASSESSED

5.9.1 Impact on ambient noise levels during construction

Potential impacts
Construction activities are generally associated with an increase in the ambient noise levels. Noise sources during the construction phase emanate from activities related to drilling, compacting of soil, loading and unloading of equipment, noise from construction vehicles and personnel.

Discussion
The impact of noise during the construction phase would be considered **low** in significance due to the distance to the nearest noise sensitive sites, i.e. farm dwellings. However, if the mitigation measures as described below are implemented, the significance of the impact would be reduced to **very low**.

Potential mitigation measures
- Ensure that standardised operating hours are adhered to during the construction phase and that exceptions such as concrete pouring that may need to occur outside of standardised operating hours, are properly approved by the local authority beforehand.
- Implement the revised Project Specification EMP presented in Annexure F.

[16] Note that employment opportunities specific to the construction phase would be managed by means of the Stakeholder Forum mentioned in Section 5.7.3 above. Since this forum has been de-linked from the EIA process, the matter is not pursued further here.

Table 5.12 : Impact table summarising the significance, both with and without mitigation, of the impact on ambient noise levels during the construction phase

	OCGT Plant and Substation site	
	Without mtg	With mtg
Extent	Site specific	Site specific
Magnitude	Medium	Low
Duration	Construction period	Construction period
Significance	Low	**Very low**
Probability	Probable	Probable
Confidence	Sure	Sure
Reversibility	Fully Reversible	Fully Reversible

5.9.2 Water and soil pollution during construction

Potential impacts

The contamination of water and soil during the construction phase is of particular concern as a number of hazardous materials will be brought onto the site. The impact of diesel and oil spillages on water bodies and soil in the study area is also of particular concern.

Discussion

The impact of soil and water pollution during the construction phase would be considered as **low** in significance. However, the significance of the impact would be reduced to **very low** with the implementation of mitigation measures.

Recommended mitigation measures

- Ensure that procedures, enforceable by means of contractual obligations per the Project Specification EMP are put in place, in order to mitigate any soil and water pollution.
- These procedures are to be written into the revised Project Specification EMP presented in Annexure F.

Table 5.13 Impact table summarising the significance, both with and without mitigation, of the impact on water and soil during the construction phase

	OCGT Plant and Substation site	
	Without mtg	With mtg
Extent	Site specific	Site specific
Magnitude	Medium	Low
Duration	Construction period	Construction period
Significance	**Low**	**Very low**
Probability	Probable	Probable
Confidence	Sure	Sure
Reversibility	Fully Reversible	Fully Reversible

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSIONS

We submit that this Final EIR provides a relatively comprehensive assessment of the environmental issues raised in the Scoping phase by I&APs, Eskom and the EIA project team. The significance of the environmental impacts associated with the proposed project are summarised in Table 6.1 and illustrated by way of shading. Dark orange and light orange indicate **high** and **medium** significance impacts respectively. Dark and light blue indicate **low** and **very low** significance impacts respectively. Green indicates that a **medium positive** impact is predicted. Neutral and "not applicable" impacts are not shaded.

In summary, the proposed project entails the addition of three generating units to the OCGT power plant that is currently under construction near the PetroSA GTL facility in Mossel Bay, as illustrated in Figure 6.

The proposed project therefore comprises the following:

- three additional gas turbine units with an output of 150 MW each;
- a fuel storage facility with a total storage capacity of 5.4 million litres
- a propane storage facility of 13m^3 ;
- two conservancy tanks, each with a capacity of 6 000 litres;
- a control room;
- a fuel supply pipeline;
- a water supply pipeline; and
- an HV yard.

Table 6.1: Summary of the significance of the potential impacts associated with the proposed development

Impact	OCGT power plant & transmission substation	
	No mitigation	With mitigation
IMPACT OF THE PROPOSED DEVELOPMENT ON THE BIO-PHYSICAL ENVIRONMENT		
Impact on flora	N (none)	L (low)
Impact on fauna	L	VL (very low)
Impact on avifauna	N	VL
Impact on air quality	N	L
Geology & drainage	M (medium)	VL
IMPACT OF THE PROPOSED DEVELOPMENT ON THE SOCIAL ENVIRONMENT		
Visual impact	H (high)	M
Impact on noise levels	H	L
Impact on socio-economic conditions	M	M+
CONSTRUCTION PHASE IMPACTS OF THE PROPOSED DEVELOPMENT		
Impact on noise levels	L	VL
Water and soil pollution	L	VL

6.1.1 Level of confidence in assessment

With reference to the information available at this planning and approval stage in the project cycle, the confidence in the environmental assessment undertaken is regarded as acceptable.

It is acknowledged that the project description may evolve during detailed design and construction and any significant deviation from that assessed in this EIR should be subject to further review.

6.1.2 Operational phase impacts on the biophysical and socio-economic environment

Table 6.1 shows the impact of the operation of the proposed development on the biophysical and socio-economic environment. The most significant impacts *without mitigation* are as follows:

- Geology and drainage.
- Visual impact.
- Noise impact.
- Socio-economic impact.

6.1.3 Construction phase impacts

With reference to construction phase impacts of the proposed development, no particular areas of concern have been identified, given that prescribed environmental control measures are implemented by means of the Project Specification Environmental Management Plan referred to in Section 5.9 above.

6.1.4 Environmental Management Plans

A compendium of EMPs has been prepared, in draft form, to address the entire project cycle as far as possible at this time, i.e. from planning, through construction and operation, and to include reference to decommissioning. This compendium of EMPs is provided in Annexure F.

The compendium comprises a contextualising introduction, together with the following additional documentation:

- A signed copy of Eskom's Safety, Health and Environment (SHE) Policy.
- Eskom's Guideline Environmental Procedure: Environmental Management Programme.
- Operational Phase EMP.
- Standard Specification EMP.
- Project Specification EMP: Construction Phase.
- Substation Construction and Operational EMP.

This hierarchy of documentation will be further refined as the EIA process unfolds and progress towards accountable decision-making is made.

6.2 RECOMMENDATIONS

With reference to the assessment described in Section 5 above, it can be noted that the significance levels of the identified impacts could generally be reduced by implementing the recommended mitigatory measures. Based on this assessment, the following section describes the various project components in terms of their biophysical and socio-economic impacts.

It is important to note that the following recommendations are based on the assumption that the relevant mitigatory measures described in Section 5 are implemented.

6.2.1 Flora and fauna

- Ensure that no Category 1 invasive alien plant species as per the Conservation of Agricultural Resources Act (No 43 of 1983) regulations are used for landscaping.
- All areas of natural vegetation within the area controlled by Eskom should be cleared of alien invasive plant species according to best environmental practice, i.e. in such a fashion that extensive areas of exposed substrate do not result before construction activities occur.
- Micro-habitats created by vegetation clumps will re-establish naturally and quickly along the new outer boundary of the additional OCGT units.
- Small raptor perches will be established along the boundary fence as fence poles which birds can use for resting, spotting and feeding.
- Local indigenous shrubs and grasses can be established along the fence-line.
- The single stone pile that will be affected can be moved to an appropriate position along the new fence line.
- If the new fence is not suitable for perching raptors then wood poles can be planted adjacent to the fence.

6.2.2 Air quality

It is recommended that once the power station is operational the emissions concentrations for NO_2 be verified.

6.2.3 Geology and drainage

- Hard surface runoff from the expanded OCGT site should be channelled into the runoff treatment system already in place for the approved OCGT plant, which should be expanded accordingly if necessary.
- Pollutants, e.g. from blade washing, should be managed by means of purpose-designed containment and disposal

6.2.4 Visual impact

- Specified attention to siting and earthworks, finishes and textures, visual screening of structures, lighting, fencing, signage and required infrastructure.

6.2.5 Noise quality

- Operating within the periods envisaged.

6.2.6 Socio-economic

- The Stakeholder Forum should be further developed insofar its composition and functioning are concerned.

- Information derived from reporting and monitoring should be easily accessible.
- A local stakeholder facilitator should be appointed to assist the project manager.
- Partnerships should be sought to further strengthen local social investment.

6.3 THE WAY FORWARD

The next stage of this EIA process involves the submission of this Final EIR to DEA&DP.

Once they have considered the document and are satisfied that it provides sufficient information to make an informed decision, DEA&DP will determine the environmental acceptability of the recommended project actions and mitigatory measures. Thereafter, DEA&DP will issue a Record of Decision and any conditions of approval relative to the authorisation, should the proposed activity be approved.

Following the issuing of the Record of Decision, DEA&DP's decision will be communicated by means of letters to all identified interested and affected parties. A 30-day appeal period follows, during which interested and affected parties will have an opportunity to appeal against the decision to the Provincial Minister of Environmental Affairs and Development Planning, in terms of the National Environmental Management Act (Act No. 107 of 1998).

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ANNEXURE A:

DEA&DP'S APPROVAL OF PLAN OF STUDY FOR EIR

ANNEXURE B:
ECOLOGICAL SPECIALIST STUDY

ANNEXURE C:
VISUAL SPECIALIST STUDY

ANNEXURE D:
SOCIAL IMPACT SPECIALIST STUDY

ANNEXURE E:

LETTER FROM MOSSEL BAY MUNICIPALITY CONFIRMING WATER AVAILABILTY

ANNEXURE F:
DRAFT ENVIRONMENTAL MANAGEMENT PLANS

Context

A signed copy of Eskom's Safety, Health and Environment (SHE) Policy

Eskom's Guideline Environmental Procedure: Environmental Management Programme

Operational Phase EMP

Standard Specification EMP

Project Specification EMP: Construction Phase

Substation Construction and Operational EMP

ANNEXURE G:
ISSUES TRAIL FROM SCOPING REPORT

ANNEXURE H:
LETTER TO LIST OF REGISTERED I&APs

Letter

Registered I&AP list

ANNEXURE I:
MEDIA NOTICES

ANNEXURE J:
OPINION REGARDING TRAFFIC SITUATION

ANNEXURE K:
RISK ASSESSMENT

ANNEXURE L:
AIR QUALITY SPECIALIST STUDY

ANNEXURE M:
NOISE IMPACT SPECIALIST STUDY

ANNEXURE N:
SPECIALISTS' DECLARATIONS OF INDEPENDENCE

ANNEXURE O:

ESKOM'S DOCUMENTATION VERIFICATION CHECKLISTS

ANNEXURE P:

MINUTES FROM FOCUS GROUP & PUBLIC MEETINGS

ANNEXURE Q:

ISSUES TRAIL & COPIES OF SUBMISSIONS

Residents Association – Dana Bay Conservancy

Boggomsbaai Ratepayers Association

Community Policing Forum – Mossel Bay

ANNEXURE R:

COMMENTS & RESPONSES FROM OTHER AUTHORITIES

DEA&DP: Directorate of Pollution and Waste Management
DEA&DP: Directorate of Strategic Environmental Management
DEAT: Directorate of Air Quality Management and Climate Change (see Annexure T)
South African National Roads Agency Limited (SANRAL)
Department of Labour: Directorate of Occupational Health and Safety
Heritage Western Cape
Mossel Bay Municipality: Planning Department
Mossel Bay Municipality: Chief Fire Officer
Eden District Municipality: Manager Health
PetroSA: Chief Fire Officer
Department of Agriculture

ANNEXURE S:

SPECIALIST PEER REVIEW DOCUMENTATION

Environmental Resources Management
Conservation Management Services
VRM Africa
Jongens Keet Associates
Airshed Planning Professionals
Liezl Coetzee

ANNEXURE T:

SUPPLEMENTARY INFORMATION (18 May 2007)