DRAFT SCOPING REPORT AND PLAN OF STUDY FOR ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR A 400KV DOUBLE CIRCUIT TRANSMISSION POWER LINE FROM FIRGROVE TO MITCHELL'S PLAIN AND MITCHELL'S PLAIN SUBSTATION

DEA Reference Number: 12/12/20/1867

September 2010

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TITLE	***:***	***DRAFT SCOPING REPORT AND PLAN OF STUDY FOR ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR A 400KV DOUBLE CIRCUIT TRANSMISSION POWER LINE FROM FIRGROVE TO MITCHELL'S PLAIN AND MITCHELL'S PLAIN SUBSTATION***
Project Team	***:***	*BKS (Pty) Ltd*
Client	***:***	*Eskom Transmission: Land and Rights*
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For BKS (Pty) Ltd

Compiled by	:	B Gordhan		
		Initials & Surname	Signature	Date
Reviewed and Approved by	:	P Teurlings		
		Initials & Surname	Signature	Date

PURPOSE OF THE DRAFT SCOPING REPORT AND PLAN OF STUDY FOR ENVIRONMENTAL IMPACT ASSESSMENT

Eskom Holdings Limited has commissioned an Environmental Impact Assessment (EIA) to investigate the potential environmental impacts for the proposed 400kV double circuit Transmission power line from Firgrove to Mitchell's Plain and the proposed Mitchell's Plain Substation (DEA Reference Number: 12/12/20/1867). The EIA is being undertaken by BKS (Pty) Ltd as an independent Environmental Assessment Practitioner (EAP), and conducted in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) [NEMA], and the EIA Regulations R385, R386 and R387 promulgated on 21 April 2006.

Environmental studies are required to address the potential impacts associated with the proposed project, and to provide an assessment of the project in terms of the biophysical, social and economic environments. It is this assessment, which aids both the environmental authorities (in this case the national Department of Environmental Affairs, DEA) and the proponent (i.e. Eskom Holdings Limited) in making decisions regarding the future of the project.

An important phase of an EIA is Scoping. This is the phase during which issues and concerns are identified in order to focus the specialist studies and to provide a framework within which the assessment is to be undertaken. The Plan of Study for EIA sets out the approach to the EIA Phase. It outlines the methodology for the EIA and includes the specialist studies that are undertaken. The details of the public participation are also included in the Plan of Study for EIA.

In keeping with environmental legislation, it is the responsibility of the EAP to ensure that the public is provided the opportunity to participate meaningfully in the environmental investigation process. This includes identification of issues and review of reports. Accordingly, interested and affected parties (I&APs) are invited to review the Draft Scoping Report (DSR) to verify that their contributions are captured and correctly understood. Issues raised by I&APs have been used, together with issues identified by the specialists, to define the terms of reference for the Specialist Studies to be undertaken in the detailed Impact Assessment Phase. The public will also have the opportunity to review the Draft EIA Report and Specialist Studies.

The comments received during the DSR review period will be incorporated into the Final Scoping Report, and submitted to the DEA who will consider the scope to be covered by the Specialist Studies, after which these studies will proceed as part of the EIA Phase, including a site-specific Environmental Management Plan (EMP), which describes the measures that need to be undertaken by the Applicant to mitigate the environmental impact assessed.

EXECUTIVE SUMMARY

Eskom Holdings Limited applied for environmental authorisation from the national Department of Environmental Affairs (DEA) for the proposed 400kV double circuit Transmission power line from Firgrove to Mitchell's Plain and the proposed Mitchell's Plain Substation (DEA Reference Number: 12/12/20/1867). The application for environmental authorisation and declaration of independence were submitted to the DEA on 26 March 2010. The DEA indicated that an Environmental Impact Assessment (EIA) process must be undertaken in order to determine the environmental authorisation.

BKS (Pty) Ltd has been appointed by Eskom Holdings Limited as the independent Environmental Assessment Practitioner (EAP) to undertake the required EIA for the proposed project. BKS (Pty) Ltd meets the requirements for the independent EAP in terms of GNR No. 385 of the EIA Regulations (2006).

OVERVIEW OF PROPOSED PROJECT

The Cape Peninsular customer load network of the Western Grid of the Western Cape Province requires further strengthening. As such, Eskom Holdings Limited proposes the construction of the new Mitchell's Plain Substation and a 400kV double circuit Transmission power line from the same Mitchell's Plain Substation to one of the following locations:

- the existing Firgrove Substation;
- the existing Stikland Substation; or
- a proposed switching station in proximity to the existing 400kV Transmission power line from the Palmiet Substation to the Stikland Substation in order to integrate the latter into this project.

The study area for the project described above [i.e. the Firgrove-Mitchell's Plain project] traverses approximately 30km in length and 1km on either side of the proposed alternative alignments. A servitude width of up to 55m for the Transmission power line still needs to be acquired.

Another project forms part of the strategic overview of the Cape Peninsular customer load network of the Western Grid of the Western Cape Province. This project entails the construction of a 400kV single circuit Transmission power line from the same proposed new Mitchell's Plain Substation indicated above to the existing Philippi Substation proposed to be upgraded [i.e. the Mitchell's Plain-Philippi project]. However, the Mitchell's Plain-Philippi project forms part of another scoping process, and is thus excluded from this Scoping

Report. It must be noted that the scoping processes for the Firgrove-Mitchell's Plain project and the Mitchell's Plain-Philippi project are undertaken in parallel.

PROJECT ALTERNATIVES

The EIA process requires the identification and analysis of alternatives in order to satisfy the need of the project. Therefore, design alternatives, route alignment alternatives for the proposed Transmission power line, location alternatives for the proposed Mitchell's Plain Substation and the "do-nothing" alternative have been identified as part of this Scoping Report.

ENVIRONMENTAL STUDIES AND PUBLIC PARTICIPATION

All the issues and concerns that have been raised by the I&APs through the various channels during the Scoping Phase, including I&AP registration forms, e-mail communications and the Public Open Days have been captured in an Issues and Response Report.

ENVIRONMENTAL SCOPING STUDY

The aim of the scoping study is to identify, record and examine the issues raised by stakeholders and specialists in regard to the proposed development. This identification and examination enables the EIA Team to focus on the Specialist Studies and provide a framework for the Impact Assessment Phase, addressing the effects of the proposed project on the environment, as well as the effects from the environment on the proposed project.

PLAN OF STUDY FOR EIA

The Scoping Phase determined that two (2) alternative route alignments and two (2) alternative locations of the proposed Mitchell's Plain Substation presented sufficient flaws at the scoping stage for the EAP to declare them as unfeasible. Therefore, these alternatives will not be considered further and will not form part of the EIA process. The following issues, amongst others, have been identified for further analysis in the EIA Phase:

- The potential relocation of settlements would result in the demolition of building structures. This would create building rubble that may require temporary storage of waste on-site.
- The potential instability of the soils generated from the Malmesburg Group.
- The economic potential of the agricultural lands within the study area.

- The sensitivity of the water bodies (rivers, drainage lines, wetlands) identified within the study area must be assessed. Areas identified of concern include, amongst others, the Eerste River, Kuils River floodplain, Mitchell's Plain wetland, Khayelitsha Wetland.
- The Driftsands Nature Reserve is noted as an area of concern within the study area. However, human activities such as illegal dumping, unrestricted access etc., must be taken into account when assessing the significance of the project's impact on the ecology, avifauna, wetlands and heritage value within this area. The heritage value of the Driftsands Nature Reserve must be considered as well. In addition, the impact of informal settlements on the Driftsands Nature Reserve will be taken into account as a cumulative impact.
- The Zevenwacht and Vergenoegd wine estates have been identified as areas of concern within the study area and that could have potential impacts. Their cultural, visual and heritage value will be considered.
- During the construction phase, the disruption in the daily living and movement patterns, safety and security and inflow of workers have been identified as areas of socio-economic concern. Schools and hospitals will also be considered during the EIA Phase.
- The potential resettlement of densely populated areas will be considered. However, the result of the resettlement process will not influence the timeframes of this EIA process.

THE WAY FORWARD

Once the Draft Scoping Report (DSR) and Plan of Study for EIA (PoS) have been reviewed by the public and stakeholders over a period of 40 days will the Final Scoping Report and the PoS (including all comments from the stakeholders and public) be submitted to the DEA for acceptance. Thereafter, the detailed specialist studies will be undertaken for the study area. Subsequently, the EIA Report will be compiled to contain the following:

- A description of the project, together with a motivation for the project and details of the alternatives that were investigated.
- A description of the general environment (social, biophysical, political, etc).
- Impacts and issues identified.
- An assessment of the significance of the identified impacts according to standard assessment criteria (nature, extent, duration, intensity, probability and significance). These impacts will be assessed with and without taking cognisance of recommended mitigation measures.
- Recommended mitigation measures.
- The Public Participation Process report, draft Environmental Management Plan (EMP) and required Specialist Study reports will be collated as a suite of appendices.

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Comment [BG1]: Check if this is part of the PP Report

LIST OF ABBREVIATIONS

amsl	above mean sea level
CoCT	City of Cape Town Metropolitan Municipality
CLN	Customer Load Network
CRS	Cross Rope Suspension
DEA	Department of Environmental Affairs
DEADP	Department of Environmental Affairs and Development Planning
DSR	Draft Scoping Report
DWA	Department of Water Affairs
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
ECO	Environmental Conservation Officer
EMP	Environmental Management Plan
HIA	Heritage Impact Assessment
I&AP(s)	Interested and affected party (-ies)
IDP	Integrated Development Plan
IRR	Issues and Response Report
ISO	International Organisation of Standardisation
kV	kiloVolt
km	kilometre
m	metre
MTS	Main Transmission Substations
N2	N2 National Road
NEMA	National Environmental Management Act, 1998 (Act 107 of 1998)
NEM:WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NWA	National Water Act, 1998 (Act 36 of 1998)
PPP	Public Participation Process
QDGC	Quarter-Degree Grid Cells
SABAP	Southern African Bird Atlas Project
SAHRA	South African Heritage Resource Agency

SANBI	South African National Botanical Institute
SANRAL	South African National Roads Agency Limited
SANS	South African National Standards
SIA	Social Impact Assessment
SDF	Spatial Development Framework
VIA	Visual Impact Assessment

1. INTRODUCTION

1.1 BACKGROUND

The Cape Peninsular customer load network of the Western Grid of the Western Cape Province requires further strengthening. As such, Eskom Holdings Limited, hereafter referred to as Eskom, applied for environmental authorisation from the national Department of Environmental Affairs (DEA) for a proposed development herein referred to as the Firgrove-Mitchell's Plain project (DEA Reference Number 12/12/20/1894). The project entails the proposes construction of the new Mitchell's Plain Substation and a 400kV double circuit Transmission power line from the same Mitchell's Plain Substation to one of the following locations:

- the existing Firgrove Substation;
- the existing Stikland Substation; or
- a proposed switching station in proximity to the existing 400kV Transmission power line from Palmiet Substation to Stikland Substation in order to integrate the latter into this project.

BKS (Pty) Ltd, hereafter referred to as BKS, has been appointed by Eskom as the independent Environmental Assessment Practitioner (EAP) to undertake the required EIA for the proposed project. BKS meets the requirements for the independent EAP in terms of GNR No. 385 of the EIA Regulations (2006).

The EIA process for the proposed development will be undertaken as per the conditions agreed to at a meeting with the DEA, Eskom and BKS on 19 April 2010. The conditions agreed to are attached in Appendix A. An application for environmental authorisation and a declaration of independence for both projects were submitted simultaneously to the DEA on 26 March 2010.

The study area extends from the Firgrove area in the east to Mitchell's Plain area in the south and west and the Stikland area in the north within the City of Cape Town Metropolitan Municipality of the Western Cape Province. The study area for the project traverses approximately 30km in length and 1km on either side of the proposed alternative alignments. A servitude width of up to 55m for the power line still needs to be acquired. The location of the proposed Mitchell's Plain substation is to be determined from this same EIA process.

BKS has also been appointed for another project that forms part of the strategic overview of the Cape Peninsular customer load network of the Western Grid of the Western Cape Province. This project entails the construction of a 400kV single circuit Transmission power line from the same proposed new Mitchell's Plain Substation indicated above to the existing Philippi Substation proposed to be upgraded [i.e. the Mitchell's Plain-Philippi project]. However, the Mitchell's Plain-Philippi project forms part of a separate EIA process in terms of a separate environmental application, and is thus excluded from this Scoping Report. It must be noted that the scoping processes for the Firgrove-Mitchell's Plain project and the Mitchell's Plain-Philippi project are undertaken in parallel, and the Scoping Reports must be read in parallel as such. Refer to Figure 1-1 for a locality map indicating both projects.

Figure 1-1: Locality Map of the combined study areas for the Firgrove-Mitchell's Plain and Mitchell's Plain-Philippi projects

1.2 PURPOSE OF THE STUDY

An EIA is a planning and decision-making tool. It identifies potential negative and positive impacts of a proposed project and recommends ways to enhance the positive impacts and minimise the negative ones. The EIA will address the impacts associated with the project, and provides an assessment of the project in terms of the biophysical, social and economic environments to assist both the environmental authority (the DEA) and the applicant (i.e. Eskom) in making decisions regarding implementation of the proposed project. The proposed development falls under the ambit of the EIA Regulations (2006) published under the Government Notice Regulation (GNR) No. 385 of 21 April 2006 in terms of Section 24(2)(a) and (d) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended [NEMA]. Cognisance will also be taken of the National Environmental Management Act: Waste Act, 2008 (Act No. 59 of 2008) [NEM:WA], the National Water Act, 1998 (Act No. 36 of 1998) [NWA], related guideline documents and other relevant legislation.

The EIA consists of three (3) phases:

- The Scoping Phase;
- The Environmental Impact Assessment (EIA) Phase; and
- The Decision-Making Phase.

1.3 PURPOSE OF THE SCOPING REPORT

The main purpose of the Scoping Phase of the project is to identify and define the issues that need to be addressed in the EIA Phase. In this regard, input from the technical team and the authorities have been considered and integrated in this Draft Scoping Report (DSR). BKS will then assess the identified impacts during the EIA Phase and recommend mitigation measures to prevent or minimise the possible impacts.

The purpose of this DSR is to document all the issues that were identified during the Scoping Phase of the EIA process and the Public Participation Process (PPP). This DSR has been made available to the public for comment from 30 September 2010 to

10 November 2010, prior to finalisation and submission to the DEA, to afford the I&APs the opportunity to check that their comments and input have been captured accurately and correctly understood.

1.4 STRUCTURE OF THIS REPORT

The following information, in accordance with Regulation No. 29 of GNR No. 385 of the EIA Regulations (2006), is included in this report:

- Project team details (Chapter 0);
- An overview of the proposed project (Chapter 3);
- A description of the project alternatives, including the justification of the project (Chapter 4);
- A description of the receiving environment (Chapter 5);
- Legislation and guidelines that pertain to the project (Chapter 0);
- Identification of the possible issues and potential impacts on the environment (Chapter 1);
- A description of the EIA process including the PPP (Chapter 8);
- A Plan of Study for the EIA (Chapter 9);
- Conclusions and Recommendations (Chapter 10); and
- References (Chapter 11).

2. PROJECT TEAM

2.1 APPLICANT

Details of the applicant are as follows:

Applicant	Eskom Holdings Limited Transmission Division: Land and Rights
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2.2 ENVIRONMENTAL CONSULTANT

Details of the Environmental Consultant are as follows:

Environmental Consultant	BKS (Pty) Ltd
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Postal Address	PO Box 3173, Pretoria, 0001
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The project is managed and the Draft Scoping Report (DSR) has been compiled by Bharat Gordhan, an Environmental Scientist from BKS. Bharat is qualified in BSc (Geography and Environmental Management) and specialises in environmental assessment processes and compilation of EMPs. He has been involved in a variety of different types of EIA processes including Eskom Transmission power lines, residential developments, upgrading of roads, filling stations, pipelines in South Africa and Mauritius. He is currently involved in the proposed Bulk Sewage Pipeline

Project from the Sekampaneng Reservoir to Sekampaneng Township, Pretoria, Gauteng.

The project is directed and main reports reviewed by Peter Teurlings, Departmental Head: Environmental Management of BKS (Pty) Ltd. Peter is registered as a Professional Natural Scientist (Registration No 400027/95) in the Environmental Science field of practice in terms of Section 18(1) of the Natural Scientific Professions Act (2003) and is also a member of the South African Chapter of the International Association of Impact Assessments (IAIA). Peter has obtained an MSc (Biogeography) and specialises in environmental assessment processes and Project Management. He has been involved in a variety of different types of EIA processes including residential developments, Transmission power lines, wastewater treatment projects, water supply projects, dams, roads and airports in South Africa.

Peter and Bharat are supported by other BKS personnel as indicated in Table 2-1. Input from Eskom Transmission has also been important for the completeness of the EIA process and accuracy of project related information.

Table 2-1: Project Team

Name	Role on Team	Company
Peter Teurlings	Project Director, EAP and Pr Sci Nat	BKS (Pty) Ltd
Bharat Gordhan	Project Manager: EIA and EMP	BKS (Pty) Ltd
Robin Swanepoel	EIA Assistance and EMP Specialist	BKS (Pty) Ltd
Simon von Witt	EIA Assistance	BKS (Pty) Ltd
Dr. David de Waal	Public Participation Leader and Social Impact Assessment (SIA)	BKS (Pty) Ltd
Eddie Mashau	Public Participation Facilitator	BKS (Pty) Ltd
Marti Moolman	Public Participation Manager	BKS (Pty) Ltd
Mamokete Maimane	Public Participation Administrator	BKS (Pty) Ltd
Elsje Greyling	Project Administrator	BKS (Pty) Ltd
Martin Steenkamp	GIS Coordinator	BKS (Pty) Ltd
Polly Sepeng	Graphic Designer	BKS (Pty) Ltd
Betsie le Roux	Ecological Investigation and Wetland Delineation	BKS (Pty) Ltd

Name	Role on Team	Company
SPECIALISTS		
Heather Davis	Geotechnical Investigation	BKS (Pty) Ltd
Mike Howard	Visual Impact Assessment	BKS (Pty) Ltd
Ingrid Snyman	SIA Assistance	Ingrid Snyman Development Consultants
Garry Patterson	Soil and Agricultural Potential Assessment	Agricultural Research Council
S G Ferreira	Agricultural Economic Potential Assessment	Agriconcept cc
Chris van Rooyen	Avifaunal Assessment	Chris van Rooyen Consulting cc
Tim Hart	Heritage Assessment	University of Cape Town (UCT)
Adv. Nicolai Massyn	Enviro-Legal Review	GreenGain Technologies (Pty) Ltd
ESKOM TRANSMISSION		
Kentridge Makhanya	Project Manager	Eskom Transmission
Jose Diez-Serrano	Engineer	Eskom Transmission
Thamsanqa Ngcobo	Senior Planner	Eskom Transmission
Dalton Matshidza	Planner	Eskom Transmission
Sipho Shabalala	Surveyor	Eskom Transmission

3. OVERVIEW OF THE PROJECT

3.1 INTRODUCTION

The bulk supply of electricity cannot be stored. Therefore, it is necessary for power to be generated and delivered over long distances at the moment it is required. Eskom Holdings Limited is divided into Eskom Generation, Eskom Transmission and Eskom Distribution divisions. Eskom Generation entails the generation of electricity at power stations. Eskom Transmission is responsible for the transmission of electricity from power stations at high voltages across the country to substations. Most cities and municipalities purchase electricity in bulk from Eskom and sell it to households, industries and other end users within their areas of jurisdiction, while Eskom Distribution also sells electricity directly to bulk end users in some parts of South Africa. The nature of bulk supply of electricity in South Africa is illustrated in Figure 3-1.

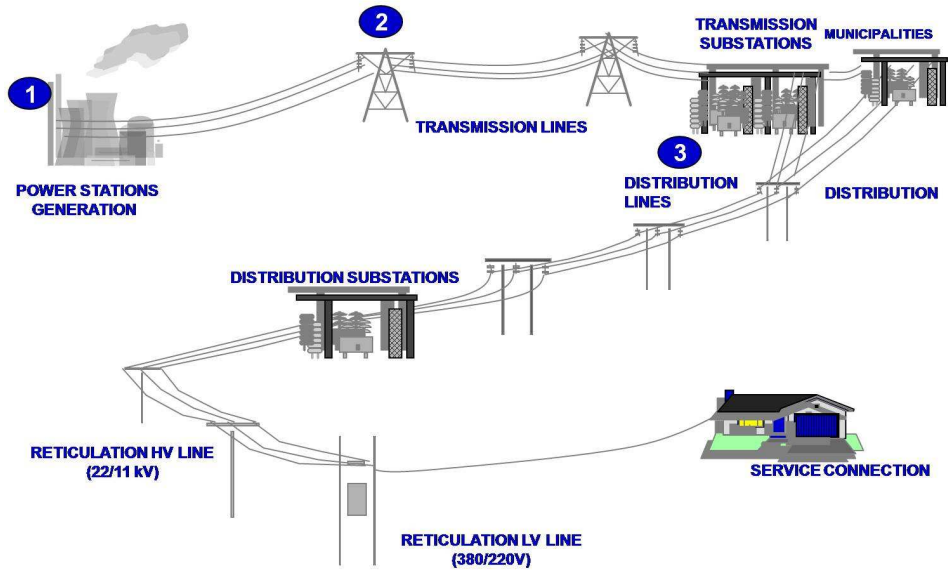

Figure 3-1: Nature of bulk electricity supply

Eskom has a mandate to satisfy potential customer needs as an essential service, which implies certain responsibilities. One of the most significant of these is to find and maintain the balance between satisfying the needs of society for electricity without having a detrimental effect on the environment. In order to achieve this Eskom must continually re-assess its present infrastructure and take into account

new developments to ensure that growing needs for electricity are satisfied, without significantly impacting on the environment.

Steel pylon towers will be constructed at intervals along the preferred route alignment at spacing of 300m – 450m. The height of pylon towers ranges from approximately 35m – 40m. However, it is important to note that the free-standing strain pylon towers will also be required for bends greater than 3° and /or in difficult terrain such as wetlands.

3.2 JUSTIFICATION OF THE PROJECT

The Customer Load Networks (CLN) in the Western Grid of the Western Cape is divided into the Cape Peninsular, West Coast, Southern Cape and Namaqualand CLNs. The project area falls within the Cape Peninsular CLN, which consists of the following as presented in Figure 3-2:

- Main Transmission Substations (MTS): Acacia, Muldersvlei, Koeberg, Philippi and Stikland 400/132kV substations; and
- Power Stations: Koeberg, Acacia and Atlantis.

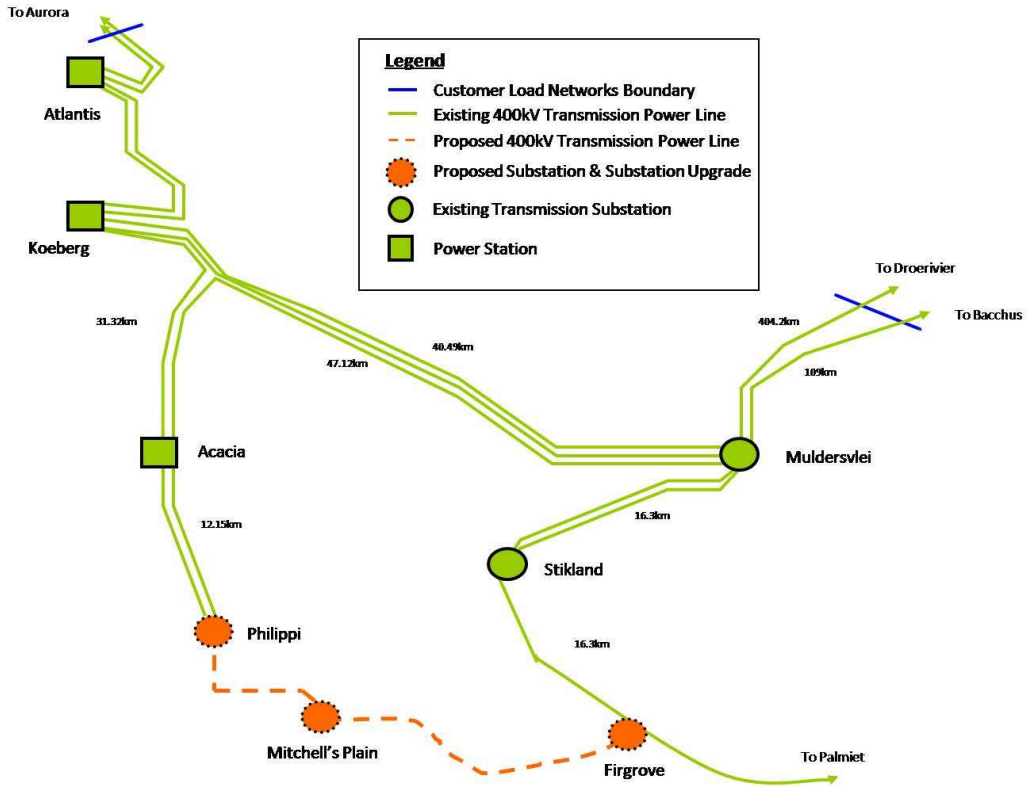

Figure 3-2: Cape Peninsular Customer Load Network

The Philippi MTS supplies the City of Cape Town Metropolitan Municipality (CoCT) with electricity and the former has run out of a stable electricity supply capacity. Therefore, a strengthening project of the Philippi MTS is required to be operational as soon as practically possible.

Due to the high density development surrounding the Philippi substation, the introduction of new feeder lines was not deemed feasible for the following reasons:

- Fault levels in area will increase beyond the equipment ratings including the cable network in the CoCT network. Since the 132kV equipment at Philippi substation is a Gas Insulator Substation type, it will be very expensive to upgrade the equipment.
- The CoCT load is not concentrated around the Philippi area, but spread as far as Simon's Town. Therefore, placing Transmission equipment at the Philippi MTS will force the CoCT to add 132kV long cables to the load.
- The area surrounding the Philippi Substation is densely developed such that servitudes for many 132kV feeders will be extremely challenging to acquire.

Therefore, Eskom proposed to construct a second 400kV injection to feed into the CoCT supply area at a new substation proposed to be located in or surrounding Mitchell's Plain. In order to supply the Mitchell's Plain Substation with sufficient capacity Eskom proposed that the supply come from one of the following sources:

- the existing Firgrove Substation;
- the existing Stikland Substation; or
- a proposed switching station in proximity to the existing 400kV Transmission power line from Palmiet Substation to Stikland Substation in order to integrate the latter into this project.

3.3 TECHNICAL DETAILS

Comment [BG2]: Still awaiting the detailed information from Kentridge

3.3.1 Proposed Mitchell's Plain Substation

The Mitchell's Plain Substation will be 350m × 350m in size. However, a corridor of 1km will be assessed for the location of the proposed substation.

3.3.2 Existing Firgrove Substation Upgrade

The existing Firgrove Substation will be upgraded. However, this proposed development does not form part of this EIA process. The EIA process is being undertaken by another EAP (Enkanyini Projects).

3.3.3 Existing Stikland Substation Upgrade

3.3.4 Switching Station

3.3.5 Transmission Power Lines

The proposed 400kV Transmission power line is proposed to entail the construction of the following infrastructure:

3.4 SERVITUDE AGREEMENT

The servitude width required to accommodate the towers on which the Transmission power line will be strung varies from 35m to 55m wide, depending on the type of pylon tower required. The servitude is required to ensure safe construction, maintenance and operation of the Transmission power line and Eskom will be entitled to unrestricted access.

For safety reasons, the Transmission power line requires minimum clearance distances, which are summarised as follows:

- The horizontal clearance to cater for swinging of the Transmission power line in adverse climatic conditions.
- The minimum vertical clearance distance between the ground and the Transmission power lines is 15m.
- The minimum vertical clearance to any fixed structure that does not form part of the Transmission power line is 0.4m – 11m.
- The maximum operational height under the tower conductors is 5.5m.
- Most farming activities can be practiced under the conductors, provided that there is adherence to safe working clearances, building restrictions and restrictions to certain crop types, e.g. tree crops.

Comment [BG3]: Ask Kentridge

Registration of the servitude allows Eskom the right to erect, operate and maintain the Transmission power lines and enter the land for the execution of such activities. It does not constitute full ownership of the land. In turn, access and the respective activities must be carried out with due respect to the affected landowners. The servitude required for the project will be registered at the Deeds office and will form part of the title deed of the relevant properties.

3.5 STUDY AREA OF PROJECT

The study area of the project extends from the existing Firgrove substation (near Somerset West) to a proposed location of the Mitchell's Plain substation. The central focus of the infrastructure in the study area is the N2 National Road (N2) from the Macassar off-ramp to the Mews Way off-ramp.

During the public open day held in Firgrove on Friday, 7 May 2010, an I&AP suggested a further route alignment alternative that was not part of the original study

area. The suggested route is from the existing Stikland substation to the proposed Mitchell's Plain Substation as opposed to the proposed route from the existing Firgrove Substation to the proposed Mitchell's Plain substation (refer to Figure 3-3). After further analysis on the technical feasibility of the route, the expanded study area was added to this on-going EIA process. Refer to Figure 3-4 for the locality map of the expanded study area.

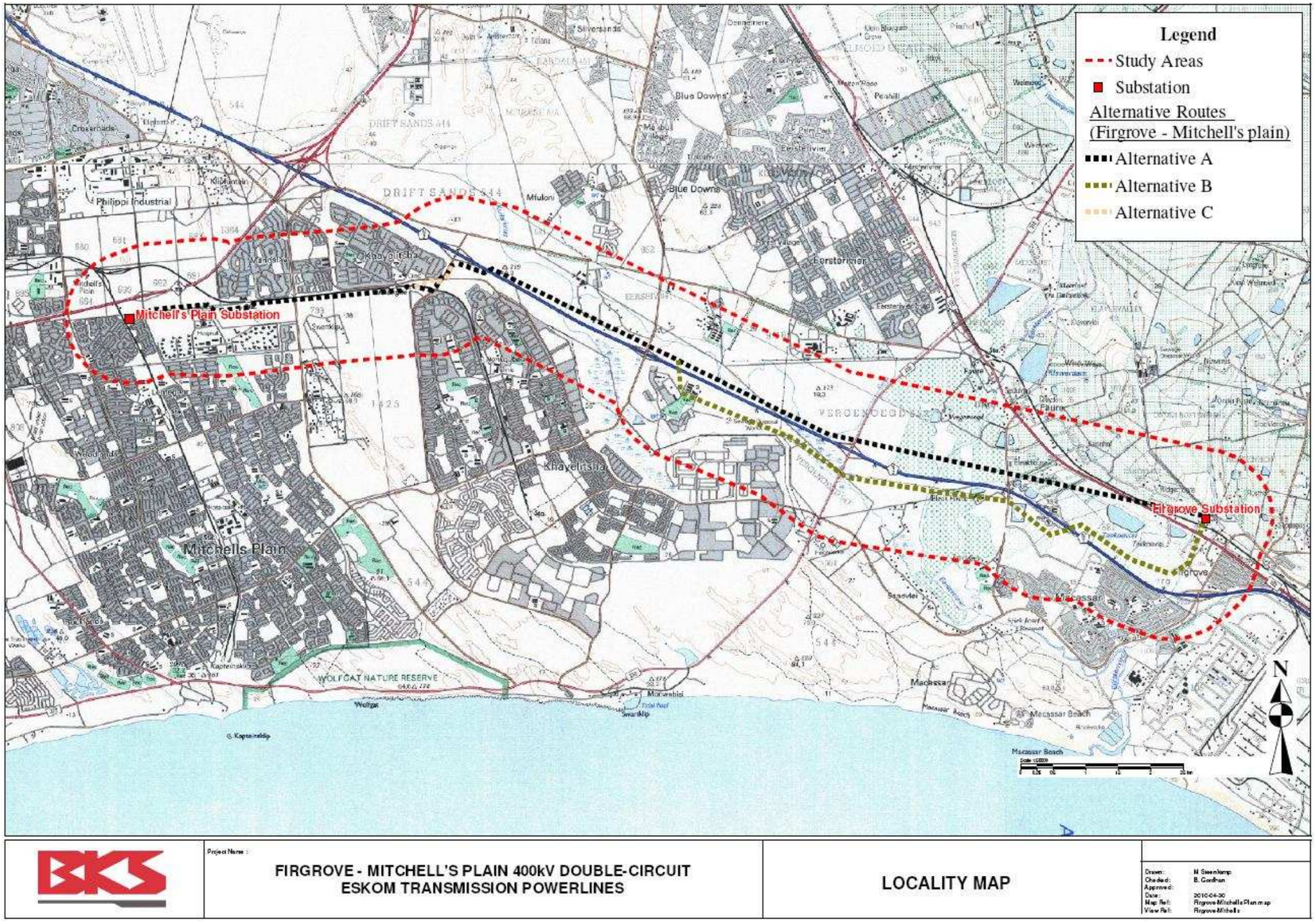

Figure 3-3: Locality Map of the original study area for the Firgrove-Mitchell's Plain project

Figure 3-4: Locality Map of expanded study area for the Firgrove-Mitchell's Plain project

3.6 CONSTRUCTION PROCESS

3.6.1 Construction Camps

The entire construction workforce is usually accommodated in a "construction camp" that will be situated at some point along the preferred route alignment (Photograph 3-1). The location will be selected by the Contractor who will take into account such aspects as access to the construction site, access to services, access to materials, etc. The Contractor will enter into an agreement with the relevant landowner for the establishment of the construction camp. The various teams will travel from the camp to the construction site each day, resulting in the teams travelling a greater distance to the site as they move along the alignment. All materials are stored at the construction camp, with the exception of the steel towers (which may come direct from the factory) and concrete. As a rule, there is usually one construction camp per 100km of Transmission power line. Therefore, only one construction camp will be used for the construction of the proposed project.


Photograph 3-1: Typical Construction Camps

3.6.2 Construction Process for Transmission Power Lines

The construction process as presented in Table 3-1 will be followed for the entire route of the new Transmission power lines. Each activity will follow the previous one, such that at any one point an observer will see a chain of events with different working teams involved. At any one time, some or all of the different teams may be working at different points along the line. Construction of this line will take approximately 12 months to complete, and is anticipated to begin before the end of 2012.

Table 3-1: Construction process for Transmission power lines

Activity	Approx Team Size	Approx Duration of Activity at a point
1 Survey of the route	By air	-
2 Determination of the conductor type and selection of best-suited conductor, towers, insulators, foundations • Define final centre line • Determine co-ordinates of each bend in the line • Undertake aerial survey to obtain an accurate profile of the area • Identify optimal tower sizes and positions	-	-
3 Final design of power line and placement of towers	-	
4 Issuing of tenders, and award of contract to construction companies	-	3 – 6 months
5 Vegetation clearance centre line (light vehicle access required) • Clear shrubs and trees as determined by the Environmental Management Programme along centre line, with the aid of a surveyor • Undertake vegetation clearing in accordance with the minimum standards to be used for vegetation clearing for the construction of the proposed Transmission power lines	5 – 15	1 – 2 days depending on local conditions
6 Centre line pegging and identification of requirements and locations for new gate (light vehicle access required)	3	1 day
7 Access negotiations (light vehicle access required) • Develop and agree on an access plan (Eskom, Contractor and landowners) • Agree to rehabilitation process • Take photographs of pre-construction conditions off site • Establish access roads (where required)	1	1 day
8 New gate installation (light vehicle access required)	5	1 day
9 Vegetation clearance (tower positions) • Clear four (4) strips (40m × 40m square for Cross Rope Suspension (CRS) towers and 20m × 20m for the self supporting towers) for assembling and erection purposes at each tower position marked	5 – 15	1 – 2 days depending on local site conditions
10 Foundation nominations for main structure and anchors (heavy vehicle access required) • Check soil types to determine foundation requirements • Dig trial pits at main foundation points (usually using mechanical back-actor/auger method, although manual labour may be used)	5	2 days

Comment [BG4]: Ask Kentridge to ask Jose.
There must be some indication of time frame taken per tower or km of line

Activity	Approx Team Size	Approx Duration of Activity at a point
11 Excavation of foundations (heavy vehicle access required) • Excavate foundations of up to 4m × 4m square and up to 4m deep, depending on soil conditions (mechanically where access to tower sites are readily available, and dug by hand where access is poor) • Cover or fence-off foundation pit until foundation is poured	15	2 days
12 Foundation steelwork – reinforcing (heavy vehicle access required) • Make up steelwork at base camp and transport to site by truck • Undertake fitting and wiring on-site (limited welding on-site)	10	2 days
13 Foundation (concrete) pouring (heavy vehicle access required) • Shuttering • Use of standard concrete truck • Where access problems exist, mix concrete on site • 28 day period required after concrete has been laid • Heavy usage of access/service roads during this stage	20	2 days
14 Delivery of tower steelwork (heavy vehicle access; extra long trucks used) • Deliver steelwork in sections and assemble on site (refer to Photograph 3-4) • Mark access roads clearly to ensure the correct tower is delivered to each site (as towers are individually designed for each location)	5	1 day
15 Assembly team/punching and painting (light vehicle access required) • Assemble steelwork on the ground • Punch nuts and paint with non-corrosive paint	10	3 days
16 Erection (abnormal load vehicle access required) • Final assembly of towers by cranes (minimum of 50 tons; refer to Photograph 3-5)	20	2 days
17 Stringing (abnormal load vehicle access required) • Place cable drums within servitude • Undertake stringing in both directions (5 – 10 km can be strung from one station) • Working are at each drum will be as long as 130m, but will be within the servitude area • Intensive vehicle activity is likely within the working area • Pilot tractor cable will place cable on the ground • Pull up cable through use of a pulley • Ensure conductors never tough the ground	50	7 days

Activity	Approx Team Size	Approx Duration of Activity at a point
18 Sag and tension (heavy vehicle access required) • Tension the line from each station to ensure that minimum ground clearance heights are achieved (i.e. 8,4 m for 400 kV lines)	10	3 days
19 Rehabilitation (heavy and light vehicle access required) • Continuous process throughout the construction phase • Will typically only commence after the first 100 towers are constructed • There is a one year guarantee on the contractors work during which rehabilitation must be concluded	5 – 15	2 – 10 days depending on local site conditions

Comment [BG5]: 100 towers required on 30km. What about shorter lines?

Photograph 3-2: Drilling of foundations

Photograph 3-3: Cover over foundations

Photograph 3-4: Towers are erected on-site

Photograph 3-5: Erection of towers by crane

3.6.3 Construction Process for the proposed Mitchell's Plain Substations

The proposed Mitchell's Plain Substation will be constructed in the following simplified sequence:

Step 1: Determination of technically feasible alternatives

Step 2: EIA input into alternative locations for substation and route alignments for the Transmission power line into the substation

Step 3: Negotiation with affected landowners

Step 4: Survey of the site

Step 5: Design of substation

Step 6: Issuing of tenders and award of contract

Step 7: Vegetation clearance and construction of access roads (where required)

Step 8: Construction of terrace and foundations, including Transmission oil pond

Step 9: Assembly and erection of equipment

Step 10: Connection of conductors to equipment

Step 11: Rehabilitation of any disturbed areas and protection of erosion sensitive areas

Step 12: Testing and commissioning

Step 13: Continued maintenance

a) Timing

Construction of the proposed Mitchell's Plain Substation will be undertaken over a period of at least 12 months.

b) Access/Service Roads:

Access/service roads are required by Eskom for the construction and maintenance phases. Access to the proposed Mitchell's Plain Substation area would be determined during the EIA Phase, when the preferred location will be ascertained.

c) On-going Maintenance:

The standard life-span of a Transmission substation and its associated components is approximately 25 years. During this period, on-going maintenance is performed, and components are replaced, which significantly extends the life-span beyond 25 years.

Comment [BG6]: What is the life of Philippi substation? And how will new upgrade ensure extended life span?

4. DESCRIPTION OF ALTERNATIVES

4.1 INTRODUCTION

"Alternatives are different means of meeting the general purpose and need of a proposed activity. The identification, description, evaluation and comparison of alternatives are important for ensuring the objectivity of the assessment process. In cases where there is no objective and thorough assessment of alternatives, the EIA process usually only confirms a chosen activity and the value of the assessment as an input to a decision-making may be compromised" (DEAT Guideline 5, 2006c). The various alternatives have been determined and screened based on specialist planning, environmental, social, engineering and economical inputs during the Scoping Phase. The feasible alternatives will be assessed during the EIA phase in terms of environmental acceptability and feasibility.

4.2 ALTERNATIVES FOR SATISFYING THE NEED

4.2.1 The "Do Nothing" Approach

The DEA stresses that the "Do Nothing" approach should be considered in cases where the proposed activity will have a significant negative impact that cannot be avoided and/or effectively or satisfactorily mitigated.

The "Do Nothing" approach necessitates that the construction of the proposed Firgrove-Mitchell's Plain project should not be undertaken. If the aforementioned scenario transpires, a new substation at Mitchell's Plain will not be able to feed the CoCT with a second 400kV injection to its supply network. In addition, the Philippi Substation will come under additional strain in order to feed the CoCT, with no additional space available to upgrade its infrastructure.

As a cumulative effect the air quality of the study area may decrease as a result of the populace of CoCT that live in low income communities within the study area being forced to seek alternative and often less sustainable means of acquiring electricity. This could lead to a further decrease in the social fabric of the study area as a residual effect.

The "Do Nothing" approach will illustrate the implications of the proposed activity not being authorised and will be used as a *status quo* against which the other alternatives will be assessed.

4.2.2 Location Alternatives

This section will detail the alternative sites that are proposed for the location of the Mitchell's Plain Substation, as presented in the locality map (Figure 3-4).

a) Mitchell's Plain Substation Alternative 1

Figure 4-1 presents the location of the Mitchell's Plain Substation Alternative 1. This 14 ha site is bounded by railway lines to the north and west, by Stock Road to its east and the R300 to its south. In addition, the existing CoCT Mitchell's Plain Substation is located to the south of the R300, opposite the proposed former substation. The site is populated with alien vegetation, i.e. Port Jackson (*Acacia saligna*) as indicated in Figure 4-1.

Figure 4-1: Mitchell's Plain Substation Alternative 1

b) Mitchell's Plain Substation Alternative 2

Alternative 2 of the proposed Mitchell's Plain Substation is located north of the Driftsands Nature Reserve (Figure 3-3). The area under investigation for the location of the Mitchell's Plain Substation Alternative 2 (as presented in Figure 4-2) is situated west of the Silversands Suburb on either side of Hindle Road. The Silversands Primary School is situated north of the area under investigation.

Figure 4-2: Mitchell's Plain Substation Alternative 2

c) Mitchell's Plain Substation Alternative 3

Alternative 3 of the proposed Mitchell's Plain Substation is located within the Driftsands Nature Reserve (Figure 3-3) along its northern boundary. The area under investigation for the location of the Mitchell's Plain Substation Alternative 3 (as presented in Figure 4-3) is situated opposite the Mfuleni settlement and to the west of the Kuils River.

Figure 4-3: Mitchell's Plain Substation Alternative 3 (north)

As part of the earlier investigations, two (2) sites within this area of investigation were earmarked to be separate alternative locations for the Mitchell's Plain Substation. However, due to its proximity to each other and the required size of a substation site (i.e. 350m × 350m or 12.25ha), this was merged into a single area of investigation. Therefore, the second location alternative within Alternative 3 as indicated in Figure 4-4 was eliminated for further consideration in the EIA Phase.

Figure 4-4: Mitchell's Plain Substation Alternative 3 (south)

d) Mitchell's Plain Substation Alternative 4

Alternative 4 of the proposed Mitchell's Plain Substation is located in a 6.73 hectares open space area south of the R300 and is enclosed on all other directions by low-income formal residential settlement. The view of Figure 4-5 is taken from its northern boundary, which is along the R300.

Figure 4-5: Mitchell's Plain Substation Alternative 4

Due to the space constraints experienced at this proposed site for the construction of the substation as well as the placement of the power lines entering and exiting the substation, this alternative position was dismissed as unfeasible from a technical point of view. In addition, there seemed to be an isolated wetland system as well as a

habitat for some avifaunal activity, which was spotted during the site visit in March 2010.

4.2.3 Route Alternatives

Four (4) route alternatives were investigated for the Firgrove-Mitchell's Plain project route alignments (refer to the locality map in Figure 3-4). Route alignment A runs from the existing Firgrove Substation, adjacent to and north of the N2 for a distance of approximately 12.5km to the point where the R300 intersects the N2, then follows the R300 to the Mitchell's plain substation for a distance of approximately 6km through the Khayelitsha area. Route alignment A is presented as a brown dashed line on the map.

Route alignment B is a deviation from route alignment A of approximately 4km to the south of the N2, and is presented as a green dashed line on the map. This deviation starts to the east of the Baden Powell interchange and crosses the N2 to join route alignment A to the east of the filling stations located on either side of the N2. This alignment is presented in order to avoid the agricultural lands, vineyards and proposed developments to the north of the N2 in this area.

Route alignment C is presented as a blue dashed line on Figure 3-4 and starts at the proposed Mitchell's Plain Substation Alternative 1, crosses the N2 to the west of the intersection with the R300, traverses through an existing electricity servitude through the Delft area, traverses part of the Driftsands Nature Reserve and connects with the Mitchell's Plain Substation alternatives 2 and 3. Thereafter, the alignment traverses northward to the existing Stikland Substation passing along the Kuils River wetland and to the west of the Kuils River suburb. There is a deviation proposed for this alignment in order to connect to Route Alignment D along the Stellenbosch Arterial Road, which will form part of this investigation.

Route alignment D is presented as a yellow dashed line on the map. This alignment starts as a deviation from route alignment A at the Mew Way interchange. The proposed alignment connects with the Mitchell's Plain Substation alternatives 2 and 3. Thereafter, the alignment traverses northward to the existing Stikland Substation passing to the east of the Kuils River suburb and the Zevenwacht farm.

4.2.4 Design Alternatives

a) Underground Cabling

A design alternative of burying Transmission power lines as opposed to overhead power lines in excess of 132kV is currently technically not feasible in South Africa. This would entail an excavation width required of a twelve lane highway 1.5m deep in order to allow for the spacing required to avoid overheating. Trees or shrubs would be prohibited on or within a specified buffer due to root invasion. Excavation in the servitude would be restricted to 0.5m deep. In addition to a significantly greater impact (except visual intrusion), underground power lines are significantly more costly to construct and maintain. Compatibility issues in connecting the deviated Transmission power lines to the existing Transmission power lines would also ensue as the existing Transmission power lines are overhead. Refer to Appendix F for more information.

b) Pylon Towers

A design alternative that can be considered is the use of different types of pylon towers for the proposed development. Different pylon tower types impact on the land use differently. Alternative pylon structures (refer to Appendix C for detailed drawings) considered are as follows:

- Self-supporting Tower (refer to Figure 4-6);
- Cross Rope Supporting Tower (refer to Figure 4-7);
- Steel Mono Pole (refer to Figure 4-8);
- Guyed Vee (refer to Figure 4-9); and
- Single Mast (refer to Figure 4-10).

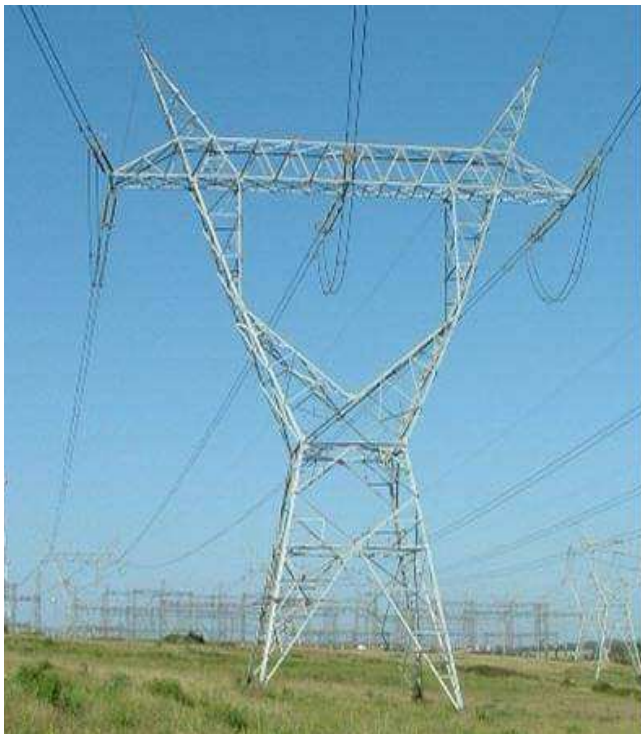

Figure 4-6: Self-supporting Tower

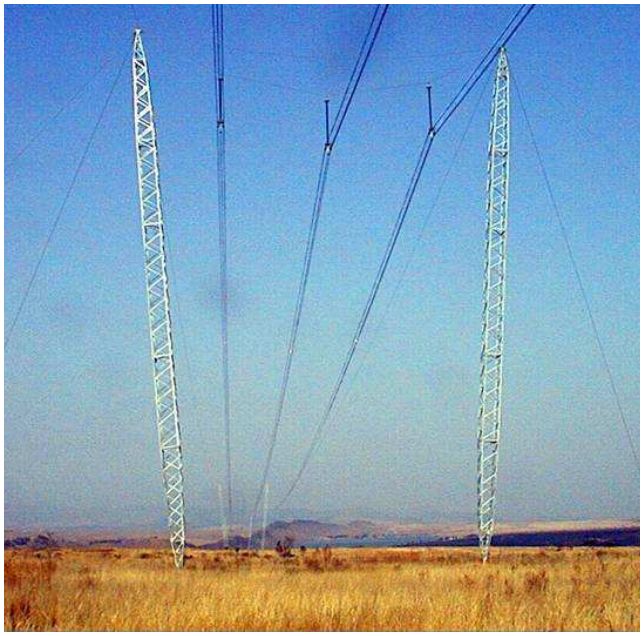

Figure 4-7: Cross Rope Supporting Tower

Figure 4-8: Steel Mono Pole

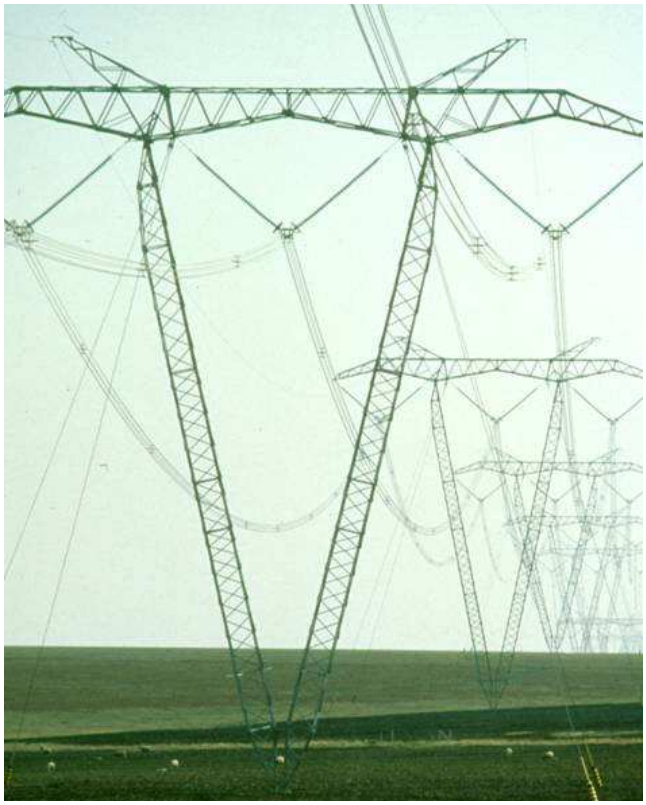

Figure 4-9: Guyed Vee

Figure 4-10: Single Mast

c) Substation Designs

Substations are classified according to the type of insulation medium. Eskom widely uses the following Substations:

- Gas Insulated Substations, with Sulfur Hexafluoride (SF_6); and
- Air Insulated Substations.

Gas Insulated Substation

A Gas Insulated Substation is a compact, multi-component assembly enclosed in a ground metallic housing, where the primary insulating medium is compressed sulfur hexafluoride (SF_6) gas. SF_6 has superior dielectric characteristics compared to air.

This reduces the clearance distance between active and non-active parts of a Gas Insulated Substation. The gas is compressed in ducts at certain pressure. A Gas Insulated Substation is assembled from standard equipment components, which are much smaller, compared to the same components for Air Insulated Substation and as a result it utilises less space. It generally consists of the following components:

- Busbars
- Circuit Breakers
- Disconnecting switches
- Earthing switches
- Current transformers
- Voltage transformers
- Cable

A typical Gas Insulated Substation is depicted in Figure 4-11 whereas the typical layout of the single phase modules used to assemble the Gas Insulated Substation is presented in Figure 4-12.

Figure 4-11: A typical Gas Insulator Substation

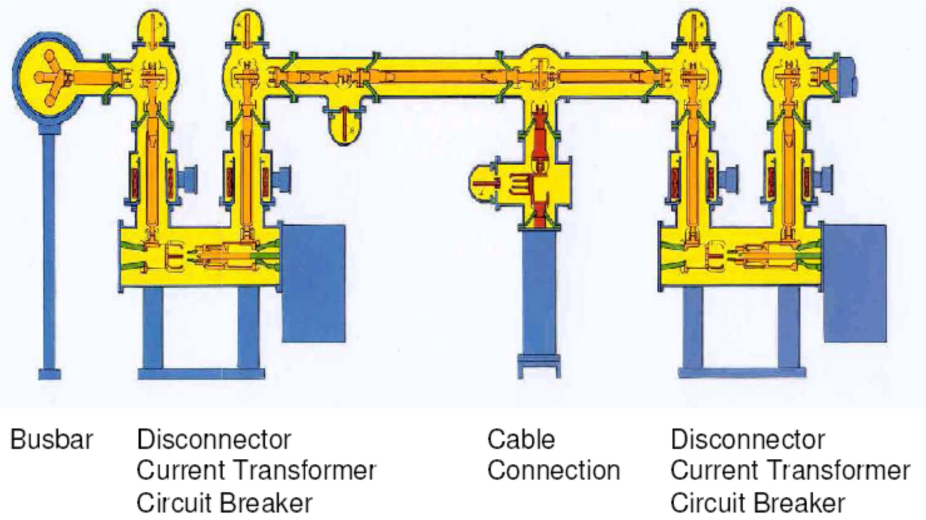

Figure 4-12: Typical single phase modules used to assemble a Gas Insulator Substation

The advantages of a Gas Insulated Substation are as follows:

- The installation is not subject to external environmental pollutants as experienced along coastal areas or heavy pollution industries in the vicinity as a result of the entire equipment being enclosed and filled with pressurised SF_6 gas.
- A Gas Insulated Substation is preferred in cosmopolitan cities, industrial townships and the like, where the cost of land is considerably higher. The higher cost of SF_6 insulated switchgear is justified by savings due to reduction in the floor area requirement.
- A Gas Insulated Substation requires less maintenance, has a long service life and is seen as more reliable.
- The construction time for a Gas Insulation Substation is considerably less.

The disadvantages of a Gas Insulated Substation are as follows:

- SF_6 is a greenhouse gas, which contributes to global warming. Should there be a leak, this hazard would be intensified.
- The cost of a Gas Insulated Substation is more than three times the cost of an electrically comparable Air Insulated Substation.

- Only the original supplier or manufacturer can be relied on for any modification or extensions of a Gas Insulated Substation.

Air Insulated Substation

Air Insulated Substations are substations where the components use air as an insulation medium. Air has inferior dielectric strength compared to Gas Insulated Substations and as a result the clearances between the active parts and non-active parts are very large compared to Gas Insulated Substations. The components used to build an Air Insulated Substation, are exposed to open air and pollution. A typical Air Insulated Substation is depicted in Figure 4-13.

Figure 4-13: A typical Air Insulator Substation

The advantages of an Air Insulated Substation are as follows:

- The cost of an Air Insulated Substation is low.
- Eliminates the reliance on original suppliers or manufacturers as the layout of the substation allows the use of equipment from a variety of suppliers or manufacturers.

The disadvantages of an Air Insulated Substation are as follows:

- The Air Insulated Substation requires a larger footprint than a Gas Insulated Substation.
- The construction time for an Air Insulated Substation is considerably longer than a Gas Insulated Substation.
- All the insulators are exposed to external environmental pollutants as experienced along coastal areas or heavy pollution industries in the vicinity resulting in air/saline contamination.
- Isolators require frequent maintenance.

4.3 PROPOSED STRATEGY FOR SATISFYING THE NEED

The need to provide CoCT with a second 400kV injection into its supply network at Mitchell's Plain would be satisfied through the establishment of a new Mitchell's Plain Substation in order to supply the Philippi Substation with sufficient capacity. The same Mitchell's Plain Substation must be connected to one of the following locations:

- the existing Firgrove Substation;
- the existing Stikland Substation; or
- a proposed switching station in proximity to the existing 400kV Transmission power line from Palmiet Substation to Stikland Substation in order to integrate the latter into this project.

5. DESCRIPTION OF THE RECEIVING ENVIRONMENT

5.1 STUDY AREA CONTEXT

5.1.1 Regional Context

The study area falls within the City of Cape Town Metropolitan Municipality (CoCT), which is the most densely populated municipality within the Western Cape Province. The Western Cape Province is located along the western coast of the Republic of South Africa. The region is also a popular tourist destination.

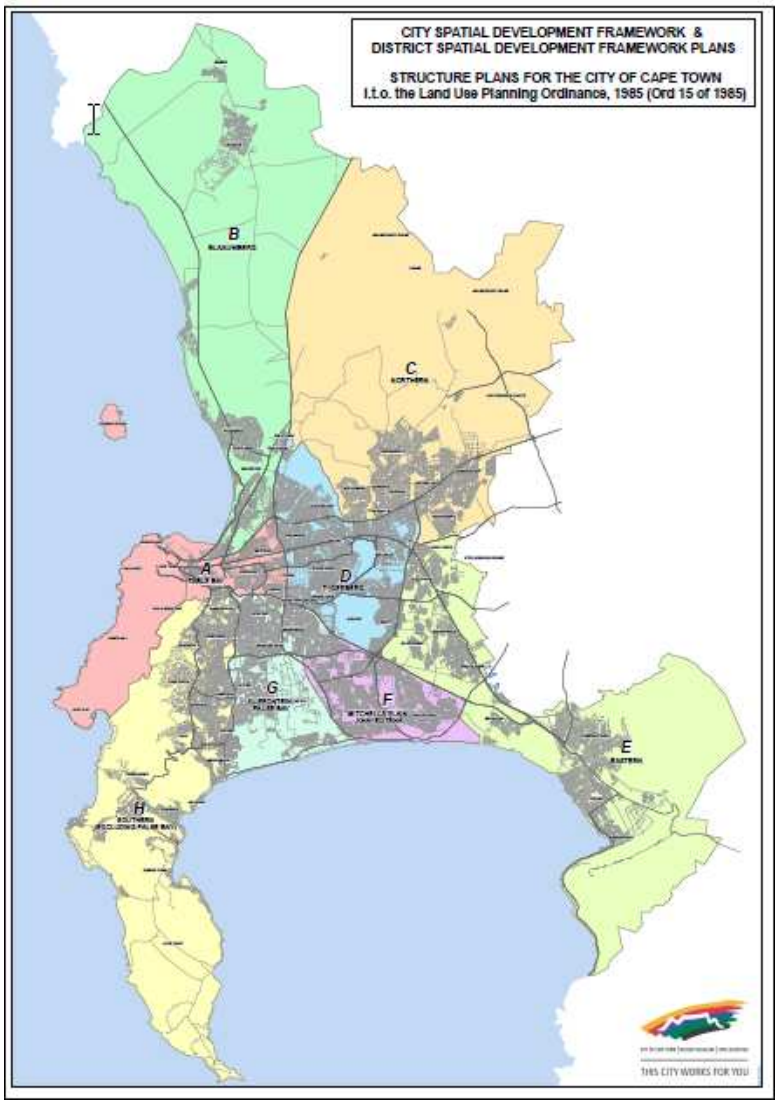

Figure 5-1: City of Cape Town Metropolitan Municipality in Regional Context (City of Cape Town, 2007)

5.1.2 Local Context

The study area is located within an area known as the Cape Flats, within the greater CoCT (Figure 3-3). The focal point to the south of the study area is the N2, which bisects the study area east-west. Marginalised communities (amongst others, Delft, Khayelitsha, Macassar and Mitchell's Plain), higher income housing developments and vineyards to the east typify the land uses across the study area. The Khayelitsha wetland system and the Driftsands Nature Reserve are located south and north of the N2 respectively. The northern section of the study area consists of residential areas, industrial areas and corridors where the Kuils River passes through.

5.2 CLIMATE AND ATMOSPHERIC CONDITIONS

The South African Weather Service (2003) affirms that the climate of the Western Cape is typically Mediterranean, with warm dry summers and mild moist winters. The study area experiences average summer temperatures of 16℃ – 26℃ with average winter temperatures between 7℃ – 18℃. Average sun shine received is 77% in summer and 62% in winter.

Average rainfall of 500mm is experienced from April to September. An increasing amount of rain is experienced during the summer months and this is associated with thunderstorms and lightning strikes. This rain, limited to an average of 100mm, falls between October and March.

The Western Cape region has traditionally been known as the "Cape of Storms" due to the strong summer and winter winds. Typically, south-easterly winds are experienced during the summer months with north-westerly winds during the winter.

The Mean Annual Temperature (Figure 5-2), precipitation (Figure 5-3), daylight hours (Figure 5-4) and the average wind speed (Figure 5-5) are presented in the figures below.

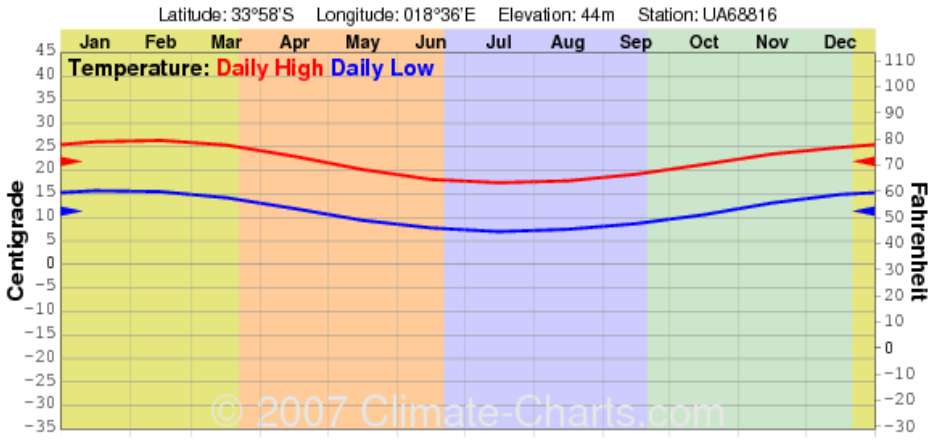

Figure 5-2: Climate Chart for Cape Town International Airport, indicating Mean Annual Temperature (Climate Charts, 2008)

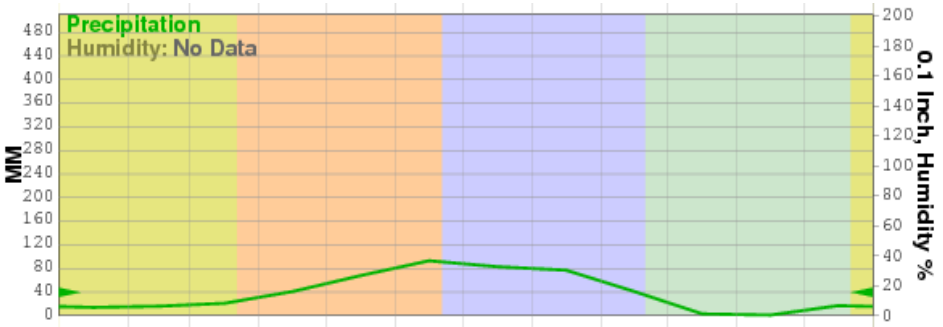

Figure 5-3: Climate Chart for Cape Town International Airport, indicating Precipitation (Climate Charts, 2008)

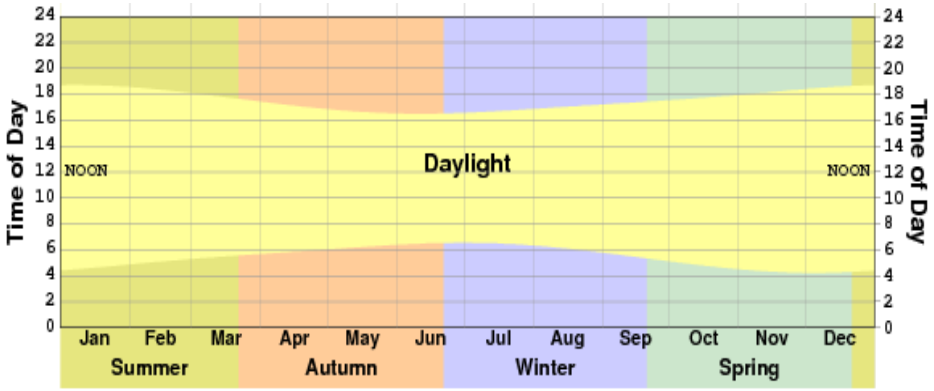

Figure 5-4: Climate Chart for Cape Town International Airport, indicating Daylight Hours (Climate Charts, 2008)

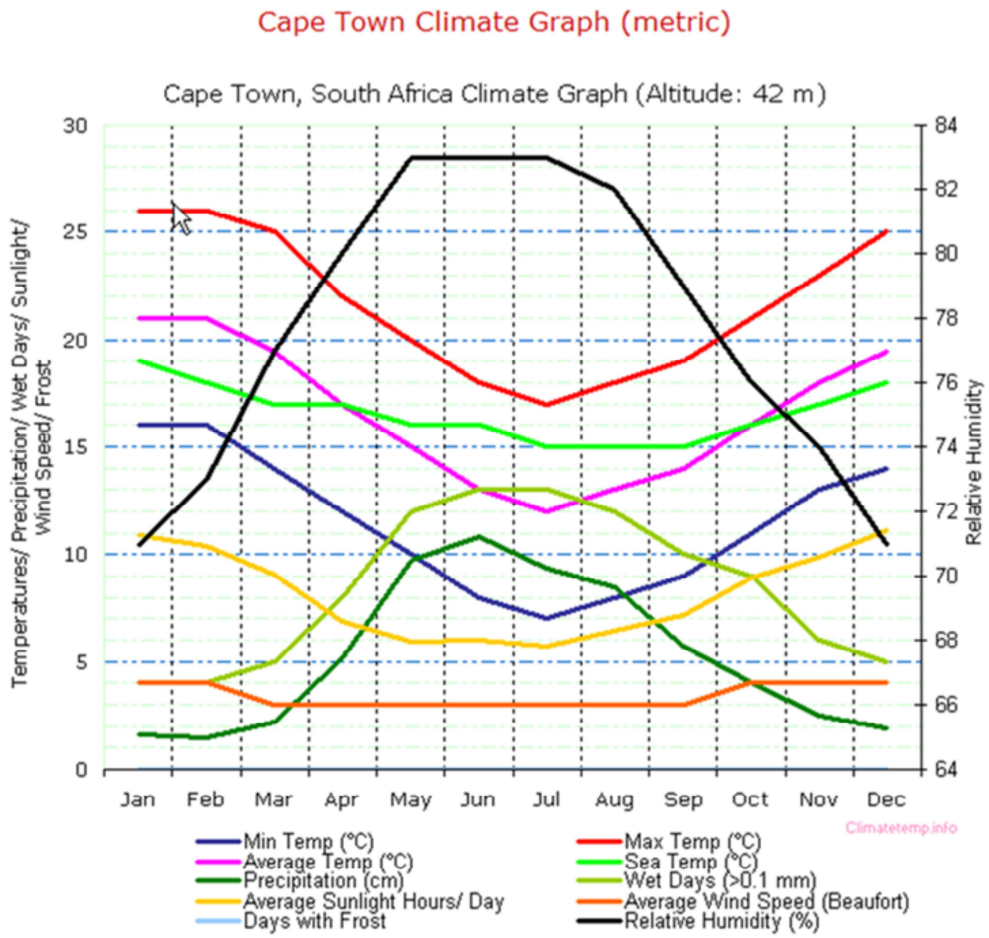

Figure 5-5: Cape Town Climate Graph (Climate Temp, 2008)

5.3 TOPOGRAPHY

The Cape Flats regressive inland dune system is situated within the suburbs of Philippi, Mitchell's Plain and Khayelitsha, which is less than 40m above mean sea level. These stabilised parabolic dunes provide for a relatively flat, sandy landscape. The majority of which is very low lying, supporting widespread vleis and wetlands (CoCT, 2009a & CoCT 2009b).

Urban sprawl and agricultural activities have transformed the landscape, resulting in isolated dune remnants up to 10m.

Figure 5-6: Typical topography of the Cape Flats area

5.4 GEOLOGY

According to the 1:250 000 scale Geological Map the study is underlain mainly by Quaternary Deposits with some of the much older rocks being present in small pockets (Figure 5-7). Table 5-1 presents the generalised stratigraphy of the study area for the Firgrove-Mitchell's Plain study area, and the approximate percentage of the alternative routes underlain by the different rock types.

The alternative locations of the proposed Mitchell's Plain substation are underlain by deposits of the Witzand Formation (CoCT, 2009a & CoCT 2009b). The semi-consolidated aeolian sandy soils of the Witzand Formation provide a building sand resource around Macassar and Blue Downs. These soils give way to the sandy soils overlaying the Cape Granite and low grade metamorphic rocks of the Malmesbury Group in the vicinity of the Firgrove area. This simple geological structure has given rise to soils with little variation.

The modified Mercalli Scale seismic intensity rating of the Firgrove-Mitchell's Plain study area is VII (i.e. difficult to stand; furniture broken; damage negligible in building of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken; noticed by people driving motor cars).

Table 5-1: Stratigraphy of the Firgrove-Mitchell's Plain study area

Map Reference	Generalised Stratigraphy			Generalised Rock/Soil Types	Approximate Percentage underlain by Stratigraphic Unit	
					Alternative A and B	Alternative C and D
Qb	Quaternary Deposits		Formation name not yet designated	Brackish calcareous soil.	10%	0%
Qw			Witzand Formation	Unconsolidated white sand with shells locally along beaches.	63%	100%
Ql			Langebaan Formation	Limestone and calcrete with calcified dune sand.	5%	0%
Qs			Springfontyn Formation	Light grey to pale red sandy soil. Occasionally peaty soils occur.	15%	0%
Nt	Cape Supergroup	Malmesbury Group	Tygerberg Formation	Greywacke, phyllite, quartzitic sandstone occasionally with inter-bedded lava and tuff.	5%	0%
N-Ck	Cape Granite Suite		Kuils River to Heidelberg Pluton	Granite and Granitic rocks.	<2%	0%

Figure 5-7: Geology of the study area

5.5 SOILS AND AGRICULTURE

The study area contains the following types of soils as described in Table 5-2 (with corresponding colours) and presented in Figure 5-8:

- Moderately deep to deep, fine-grained to medium-grained, grey to yellow sandy soils occur in the west of the study area.
- Shallower, duplex soils (i.e. sandy topsoil abruptly overlying a structured clay subsoil) of the Kroonstad (Kd) or Estcourt (Es) soil forms occur east of the study area.
- Wetland soils of the Katspruit (Ka) soil form are found next to the Kuils River and Eerste River.

Table 5-2: Soil mapping units of the study area (Soil Classification Working Group, 1991)

Map Unit	Dominant Soil Form	Soil Characteristics	Agricultural Potential
dNb	Namib	Deep (>1 200 mm), yellowish-grey, eluvial sands	Low to moderate
dHu	Hutton	Deep (> 1 200 mm), red, sandy loam soils	Moderate to high
mdNb	Namib	Moderately deep (600-1 200 mm), yellowish-grey, eluvial sands, often on cemented hardpan carbonate	Low to moderate
mdKd	Kroonstad	Moderately deep (600-1 200 mm), grey to brown, sandy soils overlying mottled, usually structured, hydromorphic loamy sand to clay loam subsoils.	Low to moderate
sNb	Namib	Shallow (300-600 mm), yellowish-grey, eluvial sands, usually on cemented hardpan carbonate	Low
sGs	Glenrosa	Shallow (300-600 mm), grey-brown, loamy topsoils on weathering rock	Low
sKd	Kroonstad	Shallow (300-600 mm), grey to brown, sandy soils overlying mottled, usually structured, hydromorphic loamy sand to clay loam subsoils; often in low-lying positions	Low
sKa	Katspruit	Shallow (300-500 mm), grey to black, fine to medium sandy to sandy loam topsoils, on hydromorphic clay loams to clay subsoils; often in low-lying areas.	Very low
vsKa	Katspruit	Very shallow (100-300 mm), grey to black, fine to medium sandy to sandy loam topsoils, on hydromorphic clay loams to clay subsoils; in low-lying areas.	Very low
Vlei	Katspruit	Virtually permanent wetland areas, surface water and hydromorphic soils	None
U	-	Built up areas that were not surveyed	None

Note: where the same mapping unit is shown with a different number attached, (e.g. dNb4 etc) this refers to a separate occurrence of the same mapping unit, as referred to in the table above.

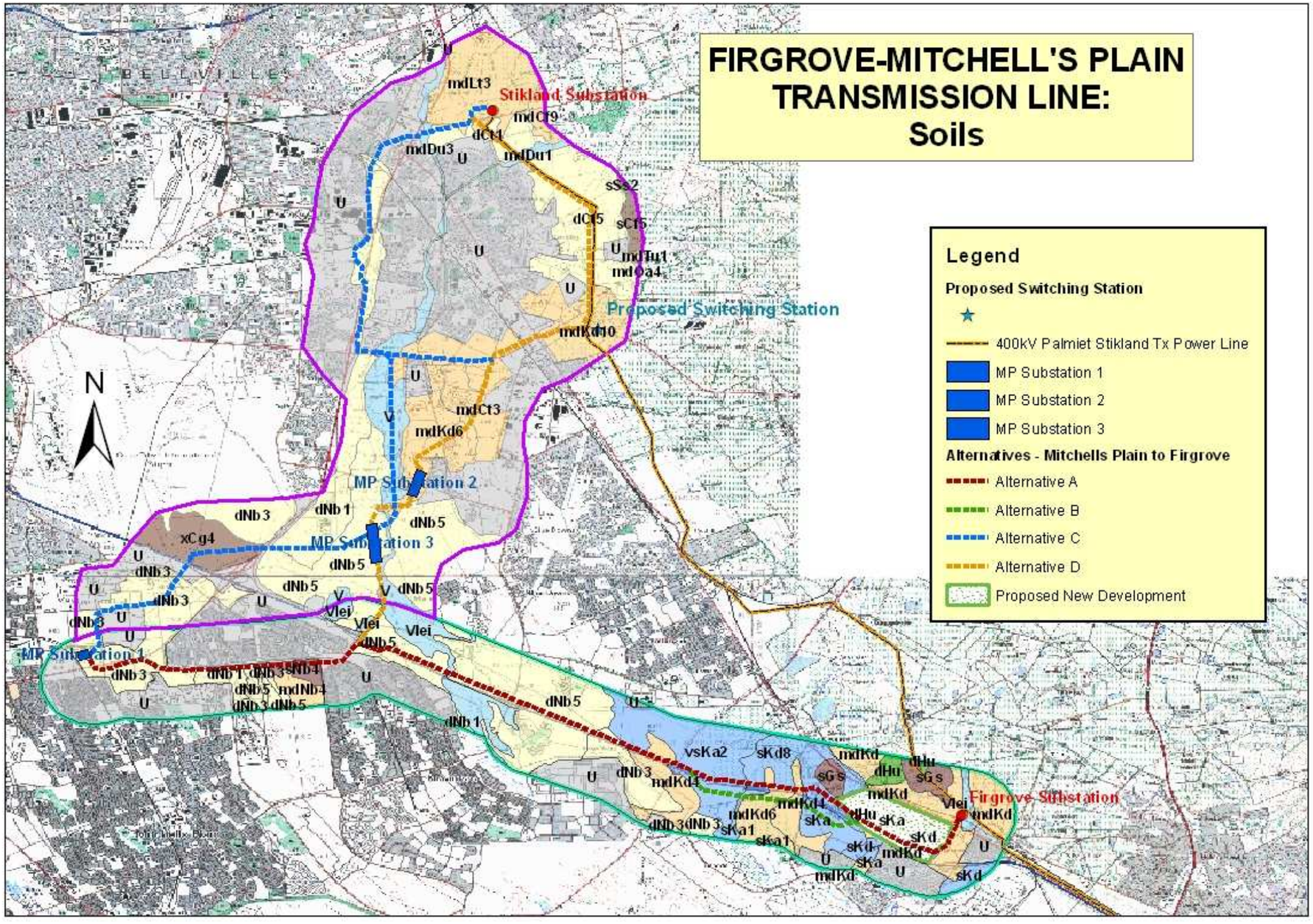

Figure 5-8: Soil formations of the study area

5.6 AGRICULTURAL POTENTIAL

The sandy soils that predominate in the study area (deep Namib soils) have a low to moderate agricultural potential. Although these sandy soils are freely-drained and easy to work, they are prone to droughtiness, due to the low clay content (often <10%), and not very fertile, with much of the nutrients having been leached out. They may also have a susceptibility to wind erosion, caused by the fine to medium grade of sand, if exposed. However, adding organic matter and fertiliser to all of these sandy soils can often make them productive.

The duplex soils (mainly Kroonstad, occasionally Estcourt) have a sandy topsoil abruptly subsoil clay horizon (often at a shallow depth) which can often result in a wetness/flooding hazard, so these duplex soils have a low agricultural potential. This is prevalent in the lowest parts of the landscape, especially close to the rivers.

5.6.1 Area close to Firgrove Substation

Cultivated land in the Firgrove-Mitchell's Plain project area extends over 482 ha. Contradictory information is found with respect to crops produced in the area close to the Firgrove Substation. However, it appears that vineyards and vegetable farming are found here.

5.6.2 Vergenoegd Wine Estate

Most of the wine estate's activities are undertaken to the west of the Eerste River, which traverses the farm. The area to the east of the Eerste River is not cultivated due to poor soils and is currently used for natural grazing purposes.

The wine estate is situated on approximately 230ha of the Vergenoegd Farm. Approximately 74ha contains established vineyards, of which 17 ha is irrigated on a permanent basis with drip irrigation system. The remaining 57ha of vineyards are produced with supplementary irrigation.

Irrigation water is conveyed by a canal upstream in the Eerste River to a lined dam on the property from where vineyards are irrigated. Water is extracted directly from the Eerste River, where necessary, and is controlled by the Lower Eerste River Irrigation Board.

The quality of the water is threatened by municipal sewage upstream. Contamination is currently at acceptable levels and does not have a negative effect on agricultural production (Jacobs, 2010).

5.7 WATER RESOURCES AND QUALITY

5.7.1 Surface Water

Large scale landscape transformation has resulted in many water bodies within the study area being degraded. Natural drainage lines have been engineered to accommodate urban development, many being directed to open canals or storm water drainage systems.

The once seasonal Big Lotus Canal and River feeding Zeekoevlei, is now heavily degraded as the attenuation works, which was designed to improve the river's water quality, has failed (Water Research Commission, 2009). According to Day *et al.* (1999) the Big Lotus River has a poor ecological status as indicated in Table 5-3 and Table 5-4.

Table 5-3: Ecological Status Classes (Day *et al.*, 1999)

Status Class	Description
Class 1	100% of potential value; unmodified, natural.
Class 2	80-99% of potential value; largely natural with few modifications. A small change in natural habitats and biota may have taken place, but the assumption is that ecosystem functioning is essentially unchanged.
Class 3	60-79% of potential value; moderately modified. A loss and change of natural habitat and biota has occurred, but basic ecosystem functioning appears to be predominantly unchanged.
Class 4	40-59% of potential value; largely modified. A loss of natural habitat and taxa and a reduction in basic ecosystem functioning has occurred.
Class 5	20-39% of potential value; seriously modified. The loss of natural habitat, taxa and ecosystem functioning is extensive.
Class 6	0-19% of potential value; modifications have reached a critical level and there has been an almost complete loss of natural habitat and biota. In the worst cases, basic ecosystem functioning no longer exists.

Table 5-4: Water Quality of the Big Lotus River (Day *et al.*, 1999)

Description	Parameter
Dissolved Oxygen	110 mg/ℓ
pH	8.4
Ammonia	0.38 mg/ℓ
Phosphorus	0.352 mg/ℓ
Faecal coliform	36 000 counts

(Source: Cape Metropolitan Council, 1998)

According to the Cape Metropolitan Council (1998), the Kuils River receives its water from adjacent agricultural lands, heavy industrial and residential areas, with only small fragments of natural vegetation. The quality of the river's water is low (Figure 5-9) and has been influenced through litter, untreated and treated effluent releases from industry and waste water treatment works, respectively. This water, which has percolated through the surrounding dune system, including portions of the Kuils River that has been canalised, feeds the Khayelitsha wetland system – the largest wetland within the study area.

Urban development has decreased infiltration, resulting in increased volumes of water requiring management. Winter flooding is now common in large portions of urbanised Khayelitsha.

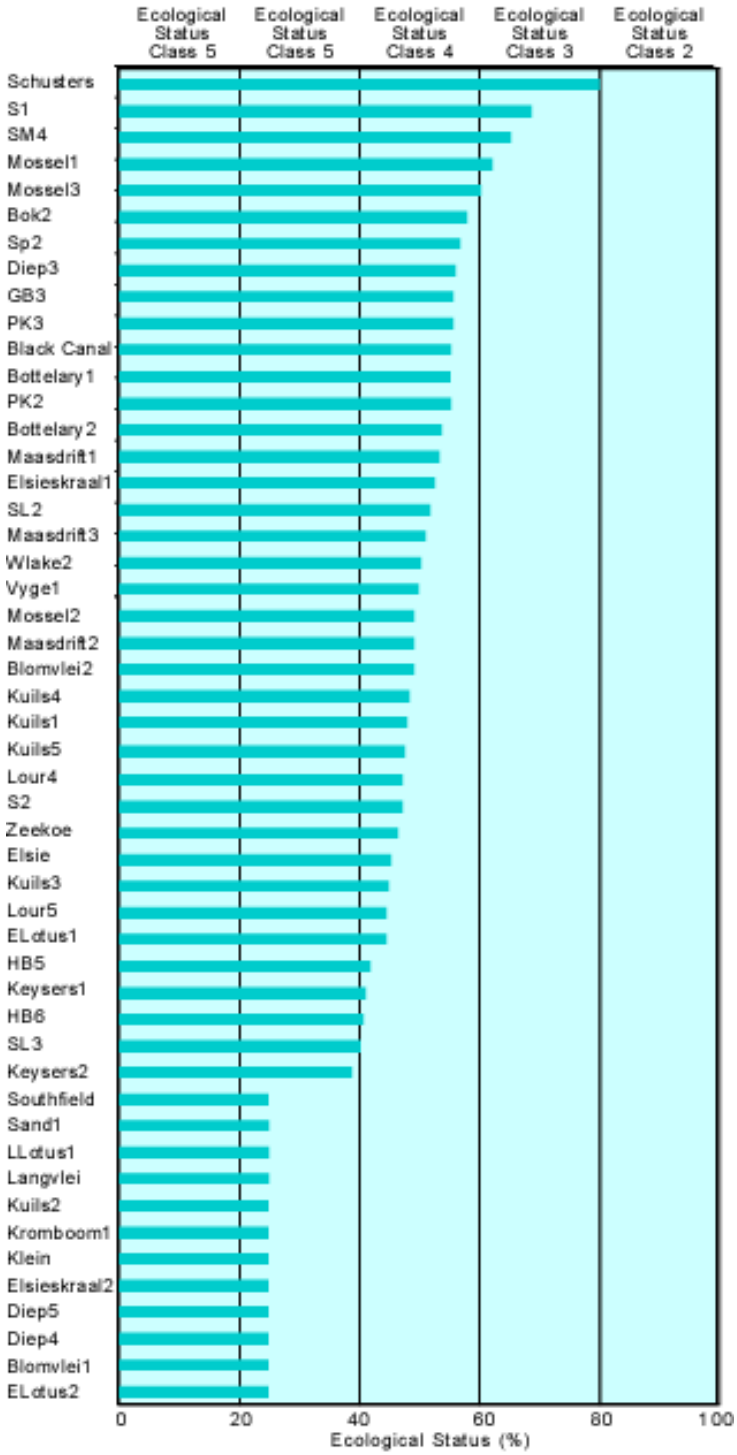

Figure 5-9: Wetland Traditional Rivers (Day *et al.*, 1999)

5.7.2 Groundwater

The Cape Flats Aquifer is the main ground water resource within the study area. The main part of the aquifer is located to the south of the N2 and flows in a westerly direction towards Zeekoevlei and a southerly direction towards Monwabisi/Mnandi.

In accordance to the University of Cape Town (2006), the aquifer is underlain by impervious Malmesbury shales or Cape granite consisting of Cenozioc deposits. Recharge is at an annual rate of 15 to 20 million m^3 with negligible contributions from the Kuils River and Zeekoevlei systems. Currently, water is being extracted in bulk from the Philippi Agricultural area, Mitchell's Plain and Strandfontein.

The chemistry of groundwater from the Cape Flats Aquifer is presented in Table 5-5. The water quality based on electrical conductivity and a mean pH value of 8 indicate that the quality is generally acceptable for any use. Quality of water in the region according to the respondents is generally good for irrigation purposes.

Table 5-5: Groundwater Chemistry from the Cape Flats Aquifer (Meyer, 2001)

Element/Parameter	Mean Value
pH	8,0
Electrical Conductivity (mS/m)	53,5
Total Dissolved Salts (mg/ℓ)	365,0
Calcium (mg/ℓ)	70,0
Magnesium (mg/ℓ)	6,0
Sodium (mg/ℓ)	21,0
Potassium (mg/ℓ)	1,5
Chloride (mg/ℓ)	29,0
PO_4 as P (mg/ℓ)	0,14
Total Alkalinity ($CaCO_3$) (mg/ℓ)	157,0
NO_3 + NO_2 (as N) (mg/ℓ)	2.86
Fluoride (mg/ℓ)	0,19
SO_4 (mg/ℓ)	33,0
PO_4 as P (mg/ℓ)	0,014
Si (mg/ℓ)	2,9
NH_4 (as N) (mg/ℓ)	0,05

Groundwater is applied for irrigation purposes in the study area. Water is extracted from boreholes and pumped into earthen dams which may be lined with chemical products to prevent seepage. Borehole yields are reported to vary between 3,7 and 25ℓ/s. The quality is also good for irrigation purposes. Borehole depth may vary between 30 and 40m (Leon, 2010). The average electrical conductivity of borehole water on the Cape Flats is 53.5mS/m. Determinants seldom exceed maximum recommended limits and groundwater generally displays a sodium-chloride-calcium-alkaline nature.

5.7.3 Wetlands

The Kuils River and the Eerste Rivier located within the study area, drain southwards to the sea and are associated with wetlands. The wetland systems herein have been named for referencing purposes in this report. Photographs of the wetland systems are presented in Figure 5-10, and a list of plant species recorded in these wetlands are indicated in Table 5-6. As such, the study area contains the following wetland systems:

- Firgrove Wetland;
- Airstip Wetland;
- Buffelsvlei Wetland;
- Khayelitsha Wetland;
- Stikland Wetland; and
- Kuils River Wetland.

Table 5-6: Wetland Species List

Plant Community	Species List
Firgrove Wetland	*Typha capensis, Persicaria lapatifolia, Acacia saligna, Pennisetum clandestinum.*
Airstip Wetland	*Phragmites australis.*
Buffelsvlei	*Typha capensis, Phragmites australis, Persicaria lapatifolia, Asclepias fruticosa, Pennisetum clandestinum*
Khayelitsha Wetland	*Phragmites australis, Typha capensis, Ricinus communis, Datura* species*, Acacia saligna, Pennisetum clandestinum*

a) Stikland Substation Wetland

The area to the east of the Stikland Substation is a canalised wetland, where the flow of water is controlled. The wetland is overgrown with the alien *Acacia saligna*.

Buffelsvlei Wetland

Khayelitsha Wetland

Firgrove Wetland

Airstip Wetland

Figure 5-10: Wetlands in the study area

b) Kuils River Floodplain

The section of the Kuils River floodplain that is in the study area flows through heavy industrial and residential areas, with only small fragments of natural vegetation. Developments are located in close proximity to the Kuils River floodplain. The plant species within specified locations of the Kuils River flowing through the study area are presented in Table 5-7 and described as follows:

- To the north of the Stellenbosch Arterial Road crossing (33°57'16.31"S; 18°39'47.76"E) the Kuils River is a channelled vall ey bottom (Figure 5-11). To the

south of this crossing, the river is much more diffuse in an unchannelled valley bottom and there is evidence of dense *Pragmites australis* (Figure 5-11).

- The Kuils River flows through the Driftsands Nature Reserve (Figure 5-12).
- The river flows through the Kuils River area near the Rouxville suburb (Figure 5-12).

Channelled valley bottom wetland north of the Stellenbosch Arterial Road

Unchannelled valley bottom wetland with *Phragmites australis* south of the Stellenbosch Arterial Road

Figure 5-11: Stellenbosch Arterial Road crossing of the Kuils River floodplain

Driftsands Nature Reserve

Kuils River area near Rouxville suburb

Figure 5-12: Kuils River floodplain

Table 5-7: Kuils River Floodplain Species List

Plant Community	Species List
Stellenbosch Arterial Road	*Phragmites australis, Zantedeschia aethiopica, Pennisetum clandestinum, Ricinus communis.*

Driftsands Nature Reserve	*Watsonia species, Zantedeschia aethiopica, Acacia saligna, Pennisetum clandestinum, sedges.*
Kuils River area near Rouxville suburb	*Pennisetum clandestinum, Zantedeschia aethiopica, Ricinus communis*

5.8 ECOLOGY

The study area can be divided into built environments or current agricultural lands where no natural vegetation is left and open spaces. The open spaces between the existing Firgrove Substation and the Mitchell's Plain area are classified into plant communities, namely alien vegetation, old agricultural lands, grasslands, dunes and wetlands, as presented in Figure 5-14. Similarly, the open spaces between the Mitchell's Plain area and the existing Stikland Substation are classified into wetlands and dunes.

5.8.1 Built-Up Environment

The majority of the study area is industrial, residential or agricultural fields with no natural vegetation left. Figure 5-13 presents photographs taken of these areas during the field survey.

Figure 5-13: Built-up areas within study area

5.8.2 Alien Vegetation

Several species of alien invasive vegetation were brought to the Cape during the 1800's for dune stabilisation works across the Cape Flats. These species have proven to be so successful that many of them have spread, pressurising adjacent fynbos areas.

The most successful of the dune stabilising alien species found within the study area, are Port Jackson (*Acacia saligna*) and Rooikrans (*Acacia cyclops*). These plants are Category 2 weeds in accordance to the Conservation of Agricultural Resources Act, 1983 (Act No. 36 of 1983) [CARA] Declared Weeds Regulations. Similarly, kikuyu (*Pennisetum clandestinum*) was introduced as a lawn grass, and has spread into wetland areas – out-competing endemic species.

Figure 5-14: Plant Communities

Acacia saligna is an invasive tree from Australia that is present in dense stands within the study area (Figure 5-15). Alien acacias result in elevated nutrient levels in the soil which convert the veld into *Eragrostis curvula* grasslands resulting in more regular fires (Mucina & Rutherford, 2006).

Other alien invasive plants that occur on the proposed development site are *Pinus pinea*, *Eucalyptus* species, *Pennisetum clandestinum*, *Persicaria* species, *Ricinus communis*, *Datura* species, *Echium vulgare* and *Plantago lanceolata*.

Figure 5-15: Alien *Acacia saligna* shrub lands within the study area

5.8.3 Old Agricultural Lands

Certain sections along the proposed development route are abandoned agricultural lands (Figure 5-16). These areas are generally covered by pioneer grass species such as *Eragrostis curvula* and *Lagurus ovatus* and forbs such as *Asclepias fruticosa*. The vegetation cover of these areas is generally more than 80% and the height is approximately 75cm. The biological diversity in these areas is low and the original fynbos veld types that were initially present on these sites have been transformed to grasslands.

Figure 5-16: Old agricultural lands within the study area

5.8.4 Grasslands

Isolated grasslands occur along the proposed development route (Figure 5-17 and Figure 5-18). Grass species found in these grasslands include *Eragrostis curvula*, *Pennisetum clandestinum* and *Lagurus ovatus*. *Acacia saligna* is found interspersed between the grasses. Alien acacias increase the nutrient content of the soil and this result in a change from typical fynbos vegetation to grasslands. Grasslands do not represent the original landscape of the veld types incorporated in the study area, and these veld types have therefore been modified.

Figure 5-17: Rodent nests in grasslands

Figure 5-18: Grasslands with intersperses of *Acacia saligna*

5.8.5 Dunes

The Driftsands Nature Reserve is situated in the middle of the study area and is central to the alternative alignments. Dunes and characteristic vegetation of the Cape Flats Dune Strandveld are found in certain areas of the Driftsands Nature Reserve (Figure 5-19). The vegetation cover on the dunes is approximately 30% and between the dunes 10%.

The following species have been recorded in the Driftsands Nature Reserve, which indicates low species diversity:

- *Osteospermum moniliferum*
- *Metalasia muricata*
- *Rhus glauca*
- *Thamnochortus insignis*
- *Pennisetum clandestinum* (alien invasive)

Facing west along the N2

Stable dune further from the N2

Facing east along the N2

North facing dune

Degradation between dunes

Degradation along the access road

Figure 5-19: Photographs of the Driftsands Nature Reserve

5.8.6 Veld Types

The veld types within the study area (Figure 5-20) are described as follows:

c) Cape Flats Dune Strandveld

The Cape Flats Dune Strandveld is characterised by a flat to undulating landscape covered by tall, evergreen hard-leaved shrubs. Grasses and herbs are also abundant. The veld type is underlain by calcareous sand of marine origin. The

conservation status of the Cape Flats Dune Strandveld is "Endangered" (Mucina & Rutherford, 2006).

d) Cape Flats Sand Fynbos

The Cape Flats Sand Fynbos has moderately undulating and flat plains with dense and rather tall ericoid shrub lands. This veld type is critically endangered with several endemic taxa (Mucina & Rutherford, 2006).

e) Swartland Shale Renosterveld

The Swartland Shale Renosterveld has moderately undulating plains and valleys supporting low to moderately tall leptophyllous scrubland. Many endemic plant species occur in this veld type and the veld type is critically endangered (Mucina & Rutherford, 2006).

f) Swartland Granite Renosterveld

The Swartland Granite Renosterveld occurs on foot slopes and undulating plains. It supports a mosaic of grassland/herb lands and microphyllous shrub land. It is dominated by renosterbos. This vegetation type is classified as critically endangered by Mucina & Rutherford (2006), as 80% has already been transformed. Approximately 2.5% is statutorily conserved (Mucina & Rutherford, 2006).

g) Cape Lowland Freshwater Wetlands

The Cape Lowland Freshwater Wetlands occurs in flats and depressions and is normally covered with *Phragmites australis* and *Typha capensis*. These wetlands are not unique like the rest of the Fynbos biome, and the vegetation in these wetlands generally occurs worldwide in similar habitats. The soils are fine, silty and clayey soils over young Quaternary sediments. Only 14% of the targeted 24% of this wetland type is statutorily conserved in the Cape Peninsula.

Figure 5-20: Veld Types

5.9 AVIFAUNA

5.9.1 Vegetation

Table 5-8 below shows the vegetation composition of the relevant Quarter-Degree Grid Cells (QDGC) (Harrison *et al.* 1997). It is generally accepted that vegetation structure, rather than the actual plant species, influences bird species distribution and abundance (Harrison *et. al* 1997). Therefore, the vegetation description below does not focus on lists of plant species, but rather on factors which are relevant to bird distribution. The description makes extensive use of the work of Harrison *et al.* (1997). This source presents a vegetation classification intermediate between that of Acocks' seventy "Veld types" (1953) and Rutherford & Westfall's seven "biomes" (1986).

The criteria used to amalgamate botanically defined vegetation units, or to keep them separate were:

- the existence of clear differences in vegetation structure, **likely to be relevant to birds**, and
- the results of published community studies on **bird/vegetation associations**.

It is important to note that no new vegetation unit boundaries were created, with use being made only of previously published data.

Table 5-8: Vegetation composition of 3418BA (Harrison *et al.*, 1997)

Biome	Vegetation type	3418BA
Fynbos	Fynbos	100%

The proposed developments are situated in 3418BA and 3318DC, which falls 100% within the Fynbos biome (Harrison *et al*. 1997). The Fynbos biome is characterized by a high diversity in plant species composition and endemism. This diversity is not paralleled in its avifaunal composition, and Fynbos is regarded as relatively poor in avifaunal diversity compared to other Southern African biomes. The endemic Fynbos avifauna consists of the Cape Rockjumper (*Chaetops frenatus*), Victorin's Warbler (*Cryptillas victorini*), Cape Sugarbird (*Promerops cafer*), Orangebreasted Sunbird (*Anthobaphes violacea*), Protea Seadeater (*Crithagra leucopterus*) and Cape Siskin (*Crithagra totta*). The Black Harrier (*Circus maurus*), a Southern African endemic species, also uses the Fynbos biome extensively for breeding.

The remaining natural Fynbos habitat along proposed Transmission power lines and substation sites is highly degraded. The original indigenous vegetation has been invaded by alien woody plants, specifically Port Jackson (*Acacia saligna*) trees, which have transformed the habitat considerably. In some places, the trees have formed dense, almost impenetrable stands. Very few patches of Fynbos remain relatively intact; the best conserved area is in the Driftsands Nature Reserve. Although the Driftsands Nature Reserve is also subject to impacts such as constant pedestrian traffic, illegal dumping and trampling by cattle, it does serve as a refuge for a variety of non Red Data avifauna or at least has done so in the recent past (refer to Table 5-9 of the avifauna recorded in the study area in alphabetical order).

Table 5-9: Avifauna Recorded in the Driftsands Nature Reserve (ADU, 2010)

Species	Scientific name
Black-necked Grebe	*Podiceps nigricollis*
Little Grebe	*Tachybaptus ruficollis*
Reed Cormorant	*Phalacrocorax africanus*
African Darter	*Anhinga rufa*
Grey Heron	*Ardea cinerea*
Little Egret	*Egretta garzetta*
Yellow-billed Egret	*Egretta intermedia*
Cattle Egret	*Bubulcus ibis*
Little Bittern	*Ixobrychus minutus*
African Sacred Ibis	*Threskiornis aethiopicus*
Glossy Ibis	*Plegadis falcinellus*
Hadeda Ibis	*Bostrychia hagedash*
Egyptian Goose	*Alopochen aegyptiacus*
Yellow-billed Duck	*Anas undulata*
Cape Teal	*Anas capensis*
Black-shouldered Kite	*Elanus caeruleus*
Common Moorhen	*Gallinula chloropus*
Red-knobbed Coot	*Fulica cristata*
Blacksmith Lapwing	*Vanellus armatus*
Barn Owl	*Tyto alba*
Red-faced Mousebird	*Urocolius indicus*

Species	Scientific name
Pied Kingfisher	*Ceryle rudis*
Pied Crow	*Corvus albus*
Cape Crow	*Corvus capensis*
White-necked Raven	*Corvus albicollis*
Cape Bulbul	*Pycnonotus capensis*
Cape Robin-Chat	*Cossypha caffra*
Grey-backed Cisticola	*Cisticola subruficapilla*
Cape Wagtail	*Motacilla capensis*
Common Fiscal	*Lanius collaris*
Southern Boubou	*Laniarius ferrugineus*
Common Starling	*Sturnus vulgaris*
Red-winged Starling	*Onychognathus morio*
Malachite Sunbird	*Nectarinia famosa*
Southern Double-collared Sunbird	*Cinnyris chalybeus*
Cape Sparrow	*Passer melanurus*
Cape Weaver	*Ploceus capensis*
Cape Canary	*Serinus canicollis*

5.9.2 Bird Micro Habitats

Whilst much of the distribution and abundance of the bird species in the study area can be explained by the description of the broad vegetation type above, it is even more important to examine the micro habitats available to birds, given the high level of transformation in the study area. These are generally evident at a much smaller spatial scale than the vegetation types, and are determined by a host of factors such as vegetation type, topography, land use and manmade infrastructure. It must be emphasised that large sections of the habitat along both proposed Transmission power lines, but particularly between the existing Philippi and Stikland substations and the proposed Mitchell's Plain Substation, have been completely transformed through dense human settlements, industrial development and massive stands of alien vegetation, particularly Port Jackson trees, leaving only isolated areas which can be utilised by birds.

The most important bird micro-habitats that were identified via a combination of Google Earth satellite imagery and field inspections are the following:

- **Arable lands**: Arable or cultivated land may at times represent a significant feeding area for some bird species in any landscape. Through opening up the soil surface, land preparation makes many insects, seeds, bulbs and other food sources suddenly accessible to birds. The crop or pasture plants cultivated are often eaten themselves by birds, or attract insects which are in turn eaten by birds. During the dry season arable lands sometimes represent the only green or attractive food sources in an otherwise dry landscape. The study area does contain several areas of old arable lands, which have reverted to a form of grassland. These areas are mostly found on both sides of the N2 between the existing Firgrove substation and the R310 off-ramp, along the first 7km of the proposed alternative alignments for the Firgrove-Mitchell's Plain project. These "grasslands" could be used by Red Data species such as Lesser Kestrel (*Falco naumanni*), Lanner Falcon (*Falco biarmicus*), Peregrine Falcon (*Falco peregrines*) and Black Harrier (*Circus maurus*) as hunting grounds, as well as non-threatened raptors, e.g. Black-shouldered Kite (*Elanus caeruleus*), Steppe Buzzard (*Buteo vulpinus*) and Jackal Buzzard (*Buteo rufofuscus*). Red Data species recorded by the South African Bird Atlas Project (SABAP) also include Blue Crane (*Anthropoides paradiseus*), Secretarybird (*Sagittarius serpentarius*), Martial Eagle (*Polemaetus bellicosus*) and Marabou Stork (*Leptoptilos crumeniferus*) but these species are likely only to occur as occasional vagrants.
- **Pans, dams and drainage lines**: The most important drainage line in the study area is the Kuils River and its associated wetlands which are bisected by the proposed alternative route alignments for the Firgrove-Mitchell's Plain project. Red Data species that could potentially make use of this habitat are Greater Painted-Snipe (*Rostratula benghalensis*), Half-collared Kingfisher (*Alcedo semitorquata*), Greater Flamingo (*Phoenicopterus ruber*), Lesser Flamingo (*Phoenicopterus minor*), African Marsh-Harrier (*Circus ranivorus*), Great White Pelican (*Pelecanus onocrotalus*), Black Stork (*Ciconia nigra*) and many non-Red Data species of water birds.

5.9.3 Relevant Bird Populations

Table 5-10 shows the reporting rates for the Red Data species that have been recorded in 3418BA and 3318DC, where the study area is situated (Harrison *et al.* 1997; ADU, 2009). For 3418BA, the total number of species recorded by SABAP was 254, while SABAP2 recorded 182 species. For 3318DC, the total number of species recorded by SABAP was 217, while SABAP2 recorded 190 species. In 3418BA, a total of 10 Red Data species were recorded by SABAP, and 7 by SABAP2 (excluding

marine species). In 3318DC, 16 Red Data species were recorded by SABAP, and 12 by SABAP2 (excluding marine species). It is important to note that these species could have been recorded anywhere within the QDGC, not necessarily along the proposed route alignments. Report rates are essentially the number of times a species was recorded in a QDGC as a percentage of the number of times that cell was counted. As mentioned earlier, the QDGCs in the study area were not equally well covered by the two atlas projects, which mean that comparison between the two datasets should be done with caution. For 3418BA, a total of 684 and 83 checklists were completed respectively for SABAP and SABAP2. For 3318DC, 686 and 244 checklists were completed respectively for SABAP and SABAP2.

Although this study will focus on the impact of the proposed Transmission power line on the above Red Data species, the non Red Data species occurring in the study area are also taken into account. Power line sensitive non Red Data species recorded in the study area include various raptors, terrestrial species and water birds.

Table 5-10: Red Data species report rates (%) for 3418BA (Harrison *et al.*, 1997; ADU, 2009)

Species	Conservation status	3418BA Reporting Rate		3318DC Reporting Rate		Habitat Requirements[1]
		SABAP	SABAP2	SABAP	SABAP2	
Great White Pelican *Pelecanus onocrotalus*	Vulnerable	69.2	75.9	26.5	21.3	Large water bodies, both inland and at the coast.
Black Stork *Ciconia nigra*	Near threatened	0.7	-	1.3	-	Cliffs for roosting and breeding, and rivers and dams for foraging.
Lanner Falcon *Falco biarmicus*	Near threatened	2.2	1.2	5.8	2.9	Generally prefers open habitat, but exploits a wide range of habitats. Will nest in wooded areas if suitable cliffs are present.
Greater Flamingo *Phoenicopterus ruber*	Near threatened	61.7	77.1	1.3	0.4	Open shallow, euthropic wetlands.
Lesser Flamingo *Phoenicopterus minor*	Near threatened	20.2	1.2	0.9	-	Open shallow, euthropic wetlands. Can tolerate more saline and alkaline conditions than the Greater Flamingo.
African Marsh-Harrier *Circus ranivorus*	Vulnerable	42.8	44.6	3.5	1.6	Large permanent wetlands with dense reed beds. Sometimes forages over smaller wetlands and grassland.
Black Harrier *Circus maurus*	Near threatened	0.1	-	1.7	1.6	In the study area most likely to be found in Fynbos and old lands.
Peregrine Falcon *Falco peregrinus*	Near threatened	0.4	12	0.1	36.0	A wide range of habitats, but cliffs (or tall buildings) are a prerequisite for breeding.
Greater Painted-snipe *Rostratula benghalensis*	Near threatened	2	1.2	0.3	4.1	Usually found close to the fringes of reed beds along shorelines of marshes, swamps, ponds and streams. Rather shy and retiring, skulking close to the vegetation so that it can retreat to cover if disturbed.
Aghulhas Long-billed Lark *Certhilauda brevirostris*	Near threatened	0.1	-	0.6	-	Fallow and recently ploughed fields, sparse shrubland dominated by renosterveld

1 Barnes 2000; Hockey *et al.* 2005; Harrison et al 1997; and personal observations

Species	Conservation status	3418BA Reporting Rate		3318DC Reporting Rate		Habitat Requirements[1]
		SABAP	SABAP2	SABAP	SABAP2	
Secretarybird *Sagittarius serpentarius*	Near threatened	-	-	0.6	Vagrant	Grassland, old lands, open woodland.
Caspian Tern *Sterna caspia*	Near threatened	-	-	1.2	0.4	Mainly estuaries, but also large inland water bodies.
Martial Eagle *Polemaetus bellicosus*	Vulnerable	-	-	-	0.8	Wide range of habitats, ranging from open woodland to semi-desert.
Half-collared Kingfisher *Alcedo semitorquata*	Near threatened	-	-	0.1	-	Fast-flowing streams with clear water and well-wooded banks.
Barlow's Lark *Calendulauda barlowi*	Near threatened	-	-	0.1	-	Sparse shrubland and well-grassed dunes.
Lesser Kestrel *Falco naumanni*	Vulnerable	-	-	0.9	-	Grassland and agricultural fields
Blue Crane *Anthropoides paradiseus*	Vulnerable	-	-	2.0	16.4	Grassland and agricultural fields
Marabou Stork *Leptoptilos crumeniferus*	Vulnerable	-	-	-	0.4	Rare outside game reserves, mostly in the semi-arid areas

5.10 CURRENT AND PLANNED LAND USE

5.10.1 Current Land Use

Agricultural activities are limited to small-scale labour intensive farming practices where fresh produce crops are grown. Agricultural lands within this study area have been left fallow, awaiting development approvals for "estate developments", with the exceptions including the Vergenoegd Wine Estate. Small scale subsistence agriculture has been noted adjacent to the N2 within the Driftsands Nature Reserve. In addition, livestock farming takes place with cattle being observed grazing within the Nature Reserve.

The study area contains a mix of land uses dedicated to conservation, agriculture, industry and human settlement. The area has a well defined road network, where Vanguard Drive (M7) and the R300 Highway provide corridors against which the Transmission power lines have been proposed. These Class 1 roads provide direct access to large portions of the proposed Transmission power lines.

The Khayelitsha and Mitchell's Plain areas in Cape Town are characterised by dense settlements lacking sufficient services and infrastructure. The CoCT will embark on the upgrading and renewal of these areas which will entail a major investment in affordable housing, poverty alleviation, training and education as well as investment in public and economic infrastructure (2007b).

In terms of residential development, the area has a range of established largely formal residential neighbourhoods including much of Mitchell's Plain (although there are significant numbers of backyard dwellers), and parts of Khayelitsha. The type of dwelling vary from detached single residential units, semi detached units and flats in areas of Mitchell's Plain and in a more limited form in Khayelitsha and Philippi. There is also a large informal settlement area, varying in terms of levels of access to services (CoCT, 2009c).

The Driftsands Nature Reserve to the north of Khayelitsha and west of Mfuleni is a provincial nature reserve managed by Cape Nature Conservation. Various high-density informal settlements are situated on the boundaries of this reserve, which increase the socio-economic pressure on the future potential of this area. The current land use in the study area is presented in Table 5-11 and Figure 5-21.

Table 5-11: Current land use in the study area

Land Use	Hectares
Vergenoegd Wine Estate	225.7
Cultivated Lands	629.9
Forestry	28.9
Residential	7 180.2
Denel (Pty) Ltd. Manufacturer of defence equipment in South Africa	176.5
Commercial/Industrial	203.7
Vacant/Unspecified	3 802.2
TOTAL	**12 247.1**

Natural forest and shrub lands are found on approximately 29ha of the study area, with built-up areas occupying approximately 1 558ha of the study area. Approximately 1 707ha of the study area is classified as vacant/unspecified.

5.10.2 Planned Land Use

In District E, the area surrounding Mfuleni (Portions of the so-called Extensions 1 and 2 located at Mfuleni Main Road) provides opportunities for further higher-density residential developments. The Strategic Development Plan for the area also indicates that remnants of vacant land, including the Happy Valley, Wimbledon Estate, Hagley and Rondevallei areas located between Stellenbosch Road (M12) and Hindle Road, offer ample opportunity for infill greenfield development. Smallholdings in the Kalkfontein area, which do not function as smallholdings, anymore have also been identified for possible future higher-density residential development (CoCT, 2009b).

Future extensions of the Blackheath Industrial area are planned to provide additional employment opportunities for the residents of Blue Downs (CoCT, 2009b).

According to CoCT (2009b), two portions of land within the Driftsands Nature Reserve are being proposed for higher-density residential infill development in order to accommodate the informal settlements of Greenpark and Los Angelos. This housing process is underway and is driven by the Provincial Housing Development Board (CoCT, 2009b). Various urban uses are proposed in the Khayelitsha area to strengthen and reinforce the Khayelitsha business district. The planned land uses for the study area is presented in Figure 3-4.

Figure 5-21: Current land use in study area

5.11 SOCIAL AND ECONOMIC

The Khayelitsha and Mitchell's Plain district include areas like Crossroads, Khayelitsha and Mitchell's Plain and is bordered by the N2 and Lansdowne Road to the north, Weltevreden Road to the west, the coastline to the south and Baden Powell Drive and the Macassar Dunes to the south-east. These areas developed extensively since the 1970's. The Cape Town International Airport is found to the north. This area falls within District F of the CoCT.

The study area from Mitchell's Plain to the Firgrove substation includes sections of Khayelitsha, open undeveloped land and agricultural land such as the Vergenoegd Wine Estate. The study area to the north of Mitchell's Plain and Khayelitsha mainly includes Delft South, the Driftsands Nature Reserve, Mfuleni, the Blackheath Industrial Area, the Saxenburg Industrial Park, Hagley and the greater Kuilsrivier area, as well as the Stikland Industrial area. These areas form part of District E of the CoCT.

5.11.1 Economic Sectors

Khayelitsha and Mitchell's Plain are typical examples of historical settlement patterns. These suburbs are isolated from the rest of the CoCT and from each other. Khayelitsha and Mitchell's Plain show poor levels of economic investment and weak preconditions for local economic activity, resulting in a lack of local employment[2]. Very little economic activity also occurs in the Delft South and Mfuleni areas, which also forms part of the south eastern section of the metropolitan area[3].

The larger Mitchell's Plain area consists of various subsections, which reflect different economic classes. Some townships are wealthier than others, and in the poorer areas gang related activities and drug trafficking among the youth are ever-present, which severely affects the quality of life of the residents in the area[4].

2 http://www.capetown.gov.za

3 City of Cape Town: Spatial Development Framework: Technical Report. Draft for public comment

4 Http://en.wikipedia.org

Another business area in the study area is the Khayelitsha business district. Many employed residents commute long distances outside the district. Informal trading around transport interchanges is an important feature of the local economy.

The key economic sector in District E is the Kuils River area which houses the Blackheath Industrial area, the Saxenburg Industrial Park, as well as the Stikland Industrial area.

5.11.2 Demographic and Socio-Economic Characteristics

The Spatial Development Plan and Environmental Management Framework for the area stated that there are 719 512 residents in the Mitchell's Plain and Khayelitsha district, which constitute 24% of the CoCT's population. The population of District F reflects the highest population density of the eight planning districts. This is distributed across the area with most of the population concentrated in Khayelitsha (2001 population: 329 000), then followed by Mitchell's Plain (2001 population: 283 196). The majority of these are youths (36% are under the age of 17, but if the age category of 18-34 years is included this figure is increased to 72%). Unemployment is also high at 38%. There would thus be a definite need for social activities, recreational facilities, sports and educational facilities, youth development, training and employment opportunities in the area.

Before 2000, Khayelitsha showed an in-migration of the majority of the population from the Eastern Cape. Since the period 2000 to 2005, migration flows show a change from primarily in-migration from the Eastern Cape to internal migration within Khayelitsha, together with in-migration from areas within the CoCT (CoCT, 2009c).

Khayelitsha is characterised by mostly informal housing facilities, whereas Mitchell's Plain is dominated by more formal type dwellings. Approximately 43% of homes in the district are informal. The district reflects some of the highest residential densities in the city and many of these settlements lack access to basic services.

With regards to health and safety the prevalence of TB and HIV is high (Khayelitsha reflects twice the national average infection rate) and socio-economic conditions contribute to the spread of communicable diseases. Levels of crime are also high, and public open spaces are not safe.

District E, which include areas such as Kuils River, Blue Downs, Mfuleni, Driftsands, Macassar, Firgrove, Eerste River, has a total population of 338 438 people (2001), with an average age of 26 years. It has the largest ratio of youth and aged dependent on the potential labour force. Over half of the households (55.9%) have either three (3) to four (4) or five (5) to six (6) people per household (CoCT, 2009b). The majority of dwellings in District E consist of formal dwellings (78.6%) and 15.6% informal dwellings, which is the second highest percentage of informal dwellings in the CoCT. The district is also the second worst off in terms of provision of services with a 13.04 Service Level Index.

Unemployment is below the City's unemployment rate of 18.2% (CoCT, 2009b) but is still considered to be high, as 38% of the working age population are unemployed. There would thus be a definite need for social activities, recreational facilities, sports and educational facilities, youth development, training and employment opportunities in the area.

5.12 HERITAGE

5.12.1 Natural Environment

The area was traditionally used as a grazing ground for Khoi herders, with indigenous hunter gatherers and early colonial settlers using the area to hunt. Today, the area falls within the CoCT's most marginalised communities, resulting in the natural environment being heavily impacted upon. Isolated remnants of the natural dune and wetland systems remain within designated or protected areas.

5.12.2 Cultural and Historic Resources

Certain cultural and historic sites within the study area reflect activities associated with the recent past and cultural activities. Mitchell's Plain's cultural history is linked with the many areas associated with the recent history and includes shebeens, gardens and sports facilities. Other features of cultural importance include, scenic drives associated with New Eisleben Road, Stock Road and Weltevreden Expressway. Buildings and avenues of trees of historical and cultural importance are located along these roads.

Khayelitsha was created as a product of the previous political dispensation and therefore has a young and limited history. This has resulted in the community with a very young and transient culture. Cultural activities associated with Khayelitsha

include the keeping of livestock, firewood and medicinal plant collection and circumcision initiation.

5.12.3 Driftsands Nature Reserve

Alternative A, C and D passes close and within the Driftsands Nature Reserve, along with Alternative 2 and 3 of the proposed Mitchell's Plain Substation.

Numerous historic records attest to the bleakness of the Cape Flats – miles of undulating sandy dunes interspersed with wetlands. The physical characteristics of this area made the Cape Peninsula an isolated enclave separated from the hinterland of the country by a landscape that was very difficult to cross on foot, horseback or by wagon. Numerous archaeological and cultural heritage impact assessments have now been completed for development and sand mining operations on the Cape Flats. The findings of these studies indicate that even in pre-colonial times the area was sparsely inhabited.

During the 17th and 18th centuries the Cape Flats was largely avoided by the colonists. Until the early 20th century, what is now known as Voortrekker Road served as the historic route by which one could cross the Cape Flats as it followed a shallow spine of high hard ground between Cape Town and Bellville.

During the 19th century most of the arable agricultural land that fringed the peninsula was cultivated and becoming increasingly urbanised. Due to the ever increasing demand for agricultural land, areas of the Cape Flats were used for grazing which further de-stabilised the dune systems. By 1870 the colonial government had loaned or sold portions of the Cape Flats for farming purposes. However, in every instance the land reverted back to the crown as successions of would-be farmers failed to achieve a viable result (Bloomer 1959). John X Merriman, the then minister of Crown Land, believed that the Cape Flats could be stabilised by introducing vegetation that could be used for growing windbreaks, and various Australian species were introduced with great effect. In 1877 a number of families of poor German immigrants were deposited on the Cape Flats equipped with tents, two weeks rations and instructed to start farming. Initially they endured severe hardship but by 1883 (Cape of Good Hope General Directory) many of these families had enjoyed some measure of success by creating fields between Port Jackson and willow windbreaks. Descendents of these German settlers continue to farm in the Philippi vegetable growing areas of the Cape Flats to this day.

The historic record attests to the difficulty of managing land on the Cape Flats. In the late 19th century the government declared certain areas "forest reserves". The motivation for these declarations was to exclude livestock that were overgrazing dune vegetation exacerbating sand mobility that threatened the newly formed farming areas (Cape Archives 1/468). By the beginning of the 20th century agriculture had become established around the fringes of the Cape Flats, however, the bulk of the area was largely undeveloped. Stabilising of the Cape Flats was a local issue for many years to the extent that in the late 19th century a series of temporary railways were built onto the flats towards what is now the Airport Industria area. The City's domestic waste was transported by train and dumped in the dune slacks (or inter-dune area) as a means of stabilising the shifting sands (Lastovica 1974).

The earliest accurate map depicting the Cape Flats is an 1890 map of the South Western Districts. Despite the fact that this map is highly detailed, the Driftsands Nature Reserve area is indicated as being "drift sands" (see Appendix E for historic maps). The Kuils River appears to have followed an irregular course, however, this is to be expected in a landscape characterised by seasonal flooding. In 1941 the Driftsands area was bounded by the Bellville Forest Reserve to the east and the Eerste River Forest Reserve to the West and the Strandfontein Forest Reserve to the south (1941 Chief Director Surveys and Mapping). The Kuils River flowed through the area in a course again different to that of today entering a large inland delta known as the "Buffelsvlei" to the south. According to the first title deed diagrams of the area (S. G. No 205/1948), the Kuils River never exited to the sea at this time but sank away into the sands of the Cape Flats, perhaps breaking through to the Eerste River in times of flood. By 1958-1959 (1959 Chief Director Surveys and Mapping) Driftsands had hardly changed, however, the Buffelsvlei to the south was beginning to be transformed with the establishment of the Eerste River Aerodrome and a work colony. By 1979 the beginnings of the Mfuleni Township had been established, however, the Driftsands area was relatively unchanged. Aerial photographs taken in 1988 show that it was at this time that the first major transformation took place within what is now the reserve itself – a large sand mine had been opened in the central area and the Medical Research Facility was in place. In the ensuing years the retention dam was built and the sand mine has reverted to a small lake and wetland inhabited by birds and amphibians. The massive transformations that saw informal settlements encroach on Driftsands occurred after 1994, while the Buffelsvlei delta has been impacted by the development of Khayelitsha. The Kuils River has become a permanent tributary of the Eerste River. The environmental history of the site points to a dynamic landscape of dunes and wetlands, the Kuils River meandering through

following a course that best suited the prevailing volume of water according to seasons and the movements of mobile dunes.

Apart from the 20th century dam, the Medical Research Facility and deductions for housing purposes (Namely Sikhumbule), the Driftsands Nature Reserve has never been subject to any formal development nor been owned by any private person or organisation. The history of deeds transfer indicates that it was initially owned by the Union of South Africa (first deed 1942) and the "Division of the Cape". In recent years portions have been subtracted for the use of the hospital facility (1972) while the whole remaining portion was transferred to the Municipality of Cape Town in 1985 (Deeds Transfers SG Folio 544/1-5). It is currently owned by the Provincial Government.

The dense sub-urban development that characterises "The Flats" today largely took place after 1960, when as a result of South Africa's apartheid policies whereby persons of colour were forcibly re-settled in a series of new townships. A massive influx of people to urban areas after 1994 resulted in the rise of informal settlements to the extent that today there is very little left of the original Cape Flats landscape. Driftsands Nature Reserve is the last enclave, which although transformed in places, imparts a sense of the ancient dune landscape.

Indications are that the Driftsands Nature Reserve was never formally settled (apart from Sikhumbule) – its existence is an accident of history in that it was a piece of land that no-body wanted or valued.

5.12.4 Vergenoegd Wine Estate

The Vergenoegd farm has been owned by the Faure family for six generations since the 1820's. This farm was granted rights in 1772, and is considered to be an important heritage site of provincial significance (Fransen 2006). The Cape Dutch homestead consists of a yard and complex of vernacular buildings of high architectural importance on the edge of the winelands. Recently restored it is a celebrated heritage site and a popular wine route stop-off point.

5.12.5 Zeekoeivlei Historic Site

Originally known as Vogelsang, the land was granted in 1702 to Sarah Tas, the sister of Adam Tas (the famous freeburgher who was instrumental in bringing the corrupt

governor Willem Adriaan Van der Stel, to justice). At the time Sara Tas was unmarried – a fact which has caused some speculation as it was very unusual for an unmarried woman to be granted land. The farm was owned for many years by persons who were the elite of the 18th century colony. In 1720 the land was owned by Johannes Swellengrebel (father of Governor Hendrik Swellengrebel) who also owned Zandvliet in Macassar. Later on the farm was owned by Hendrik Cloete who later sold it and several other farms in the district before taking up ownership of Groot Constantia on the Peninsula. By 1800 Vogelsang had taken on the name of the Vlei on the property – Zeekoeivlei, the name which it has retained to this day. In 1818 the farm once again was owned by the Cloete family when Pieter Lourens Cloete (fifth son) acquired the farm. Sometime later in the 19th century the farm came into the possession of Mr C Allderman whose descendants owned the property until the present day.

It is highly likely that the land was initially used for cattle farming; however we can surmise that Hendrik Cloete may well have started vine cultivation on the land as this was a particular interest of his. Vine cultivation was practiced by the Allderman family until 1985, after which they reverted to dairy farming.

The main homestead (Zeekoeivlei) and associated outbuildings form a significant complex of historic structures, which together with the yard and garden and access routes form a highly conservation worthy cultural environment.

The approach to this complex is via a causeway through the surrounding wetlands. The homestead which has its own separate gateway is hidden behind trees and a well established hedge. The access road continues around the rear of the outbuildings into the lands. The main homestead and outbuildings form a tightly associated cluster of structures contained within beautifully maintained surroundings, wetlands and dams.

The homestead is a large house laid out in a typical "T" shape characteristic of vernacular dwellings of the 18th – early 19th century. It has a thatched roof with a full length – width solder, and half hipped (wolfneus) end-gables, but no front gable. There is a front stoep. The joinery (fenestration, internal shutters, doors) is Georgian and early Victorian (early-mid 19th century) and generally in very good condition. The internal layout of the building is atypical of what would be expected in "T" shaped houses in that extensive use has been made of corridors throughout (a British borrowing).allowing separate access to individual rooms. The front portion of the "T"

appears to have had a more typical symmetrical layout with rooms on either side of the front entrance way. The rooms and corridors are lofty and spacious, the original imported pine (probably North European) ceiling boards and grooved beams exist throughout.

Photograph 5-1: Main Homestead

Two later Victorian additions were made to the building while 20th century alterations have been restricted to moving some internals walls and doorways. A garage or *waenhuis* built from stone attached to the end of the "T" is probably a pre-Victorian feature.

The building is well cared for, and surrounded by a beautifully maintained and tranquil garden set among wetlands, ponds and established trees and hedges.

The homestead has not been logged in the SAHRA National database, which means that it is unlikely to have been formally described or published in any of the key volumes on architectural heritage. Fransen and Cooke mention the Zeekoeivlei briefly in their book mentioning the combination of early Victorian and vernacular

elements. Cooke is of the opinion that the homestead was built in 1849 – a date consistent with the style of joinery and finishes abundant in the house today[5]. The "T" shaped layout of the building is either a borrowing from earlier vernacular floor plan styles, or indicates that the house may have been built substantially earlier but was extensively rebuilt in the early-mid 19th century.

The homestead is a really interesting and comparatively rare example of a transitional style of architecture that reflects both vernacular architectural values and the influence of British architectural styles that were increasingly adopted by residents of the Cape after the British take-over in 1806. The house incorporates intact vernacular, Georgian and Victorian elements that reflect its development over time.

5.12.6 Zewenwacht Wine Estate

Part of the Zewenwacht Wine Estate is situated within the study area. Zewenwacht is famous for its historic homestead, its gardens and views towards Table Mountain. It is a declared heritage site and a part of the Cape Winelands Cultural Landscape.

5.13 Economic Potential of Agricultural Land

The total labour requirements for vegetable production are shown in Table 5-12. One (1) hectare of vegetables creates approximately 1.3 employment opportunities. The total labour requirements for vineyard production, excluding labour requirements in cellar is approximately 150 man days/ha or 0.65 employment opportunities/ha.

Table 5-12: Labour requirements for vegetable production in the Western Cape

Type	Man Days/hectare	Man Years/Hectare
Permanent	210	0.9
Seasonal	90	0.4
Total	**300**	**1.3**

5 Mrs. Joan Allderman, Pers. Comm.

6. LEGISLATION AND GUIDELINE DOCUMENTS

6.1 INTRODUCTION

Section 24(C) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) [NEMA], as amended, indicates that the "Minister of Water and Environmental Affairs, or an organ of state with delegated powers, is the Competent Authority in the following circumstances and should be submitted to national DEA for review:

- Implications for national environmental policy or international environmental commitments or relations.
- Takes place within an area where South Africa has international environmental obligations, such as international conventions, except for any area falling within the sea-shore, a conservancy, a protected natural environment, a proclaimed private nature reserve, a natural heritage site, or the buffer zone or transitional area of a biosphere reserve or a world heritage site.
- Affects an area that crosses either provincial or national boundaries.
- Is undertaken, or is to be undertaken, by:
    - A national department;
    - A provincial department responsible for environmental affairs;
    - A statutory body, excluding any municipality, which has been delegated the authority from either a national or provincial department to be responsible for a specific activity or set of activities; or
    - Will take place within a national proclaimed protected area or other conservation area under control of a national authority.
- When a need for arbitration due to issues specific with respect to a difference or disagreement regarding the protection of the environment in terms of the specific project is considered appropriate".

Since the applicant (i.e. Eskom Holdings Ltd) is a parastatal, the application for a Scoping/EIA process has been submitted to the DEA as the approving authority. The Western Cape Provincial Department of Environmental Affairs and Development Planning (DEADP), the national Department of Water Affairs and Cape Nature will act as commenting authorities in the EIA process.

6.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT

The National Environmental Management Act, 1998 (Act No. 107 of 1998) [NEMA], as amended, provides a framework for the integration of the environmental management activities of various spheres of government. It promotes integrated management to ensure sustainable resource utilisation and development and requires that the DEA be the lead agent in ensuring effective custodianship of the environment. It also provides that sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where subjected to significant human resource usage and development pressure. The NEMA principles clearly emphasize the need to protect threatened ecosystems and are binding on all organs of state including the local authorities.

An application for development has to conform to the requirements of the NEMA and the regulations promulgated in terms of Section 24(1) thereof. The regulations promulgated under Section 24(1) are currently listed in GNR No. 385, GNR No. 386 and GNR No. 387 of 6 June 2006. All applications listed in the abovementioned regulations shall be subjected to a Scoping/EIA process and will require Environmental Authorisation from the DEA. Section 24(c) of NEMA prohibits the undertaking of identified activities except by virtue of a competent authority.

Section 23 of NEMA further determines that Integrated Environmental Management should be employed when any policies, programmes, plans or projects are drawn up to minimise the impact on the environment. The duty of municipal officials to prevent pollution and ecological degradation, to promote conservation and secure ecologically sustainable development and use of natural resources, originates from the Constitution and the NEMA.

When the approving authority (DEA) is satisfied with the proposed development in terms of the NEMA and the EIA Regulations (2006), the relevant department issues Environmental Authorisation for the development. This Environmental Authorisation may include a list of conditions that must be complied with. These conditions must be strictly adhered to, as they are compiled specifically to ensure that adequate mitigating measures will be taken to minimise the negative effects of the development.

The conditions imposed by the Environmental Authorisation would generally include, *inter alia*:

- measures to prevent, manage and mitigate environmental impacts to acceptable levels;
- prevention of pollution of water bodies and groundwater;
- a rehabilitation programme for disturbed natural and/or heritage areas;
- appointment of an Environmental Control Officer (ECO), to oversee the construction phase and to ensure that the development phase is conducted in an environmentally responsible manner;
- conservation management and visitor management plans; and
- requirements of other authorities, such as DWA, the Department of Minerals and Energy and the SAHRA.

6.2.1 Activities Applicable to the National Environmental Management Act

The construction of the Firgrove-Mitchell's Plain 400kV double circuit Transmission power line, the Mitchell's Plain substation and associated infrastructure falls within the ambit of the list of activities (Table 6-1) identified in terms of sections 24(2)(a) and (d) of the NEMA.

Table 6-1: Listed Activities in terms of the National Environmental Management Act

Number and date of the relevant notice	Activity No(s)	Description of each listed activity
SCOPING/EIA PROCESS		
Section 24 (5) of the National Environmental Management Act, 2006, published under Government Notice No. R. 387, 21 April 2006	1(e)	The construction of facilities or infrastructure, including associated structures or infrastructure, for 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 Government Notice No. R. 386 of 2006
Section 24 (5) of the National Environmental Management Act, 2006, published under Government Notice No. R. 387, 21 April 2006	1(l)	The construction of facilities or infrastructure, including associated structures or infrastructure, for the transmission and distribution of above ground electricity with a capacity of 120 kilovolts or more.
Section 24 (5) of the National Environmental Management Act, 2006, published under Government Notice No. R. 387, 21 April 2006	2	Any development activity, including associated structures and infrastructure, where the total area of the developed area is, or is intended to be, 20 hectares or more.

Number and date of the relevant notice	Activity No(s)	Description of each listed activity
BASIC ASSESSMENT PROCESS		
Section 24 (5) of the National Environmental Management Act, 2006, published under Government Notice No. R. 386, 21 April 2006	1(m)	The construction of facilities or infrastructure, including associated structures or infrastructure for any purpose in the one in ten year flood line of a river or stream, or within 32 metres from the bank of a river or stream where the flood line is unknown, excluding purposes associated with existing residential use, but including canals; channels; bridges; dams; and weirs.
Section 24 (5) of the National Environmental Management Act, 2006, published under Government Notice No. R. 386, 21 April 2006	4	The dredging, excavation, infilling, removal or moving of soil, sand or rock exceeding 5 cubic metres from a river, tidal lagoon, tidal river, lake, in-stream dam, floodplain or wetland.
Section 24 (5) of the National Environmental Management Act, 2006, published under Government Notice No. R. 386, 21 April 2006	7	The above ground storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 cubic metres but less than 1 000 cubic metres at any one location or site.
Section 24 (5) of the National Environmental Management Act, 2006, published under Government Notice No. R. 386, 21 April 2006	12	The transformation or removal of indigenous vegetation of 3 hectares or more, or of any size where the transformation or removal would occur within a critically endangered or an endangered ecosystem listed in terms of Section 52 of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).
Section 24 (5) of the National Environmental Management Act, 2006, published under Government Notice No. R. 386, 21 April 2006	14	The construction of masts of any material or type and of any height, including those used for telecommunication broadcasting and radio transmission, but excluding - (a) masts of 15 metres and lower exclusively used: (i) by radio amateurs; or (ii) for lighting purposes (b) flag poles; and (c) lightning conductor poles.
Section 24 (5) of the National Environmental Management Act, 2006, published under Government Notice No. R. 386, 21 April 2006	15	The construction of a road that is wider than 4 metres or that has a reserve wider than 6 metres, excluding roads that fall within the ambit of another listed activity (e.g. national roads) or which are access roads of less than 30 metres long.
Section 24 (5) of the National Environmental Management Act, 2006, published under Government Notice No. R. 386, 21 April 2006	16	The transformation of undeveloped, vacant or derelict land to – (a) establish infill development covering an area of 5 hectares or more, but less than 20 hectares; or (b) residential, mixed, retail, commercial, industrial or institutional use where such development does not constitute infill and where the total area to be transformed is bigger than 1 hectare
Section 24 (5) of the National Environmental Management Act, 2006, published under Government Notice No. R. 386, 21 April 2006	18	The subdivision of portions of land 9 hectares or larger into portions of 5 hectares or less.
Section 24 (5) of the National Environmental Management Act, 2006, published under Government Notice No. R. 386, 21 April 2006	20	The transformation of an area zoned for use as public open space or for a conservation purpose to another use.
Section 24 (5) of the National Environmental Management Act, 2006, published under Government Notice No. R. 386, 21 April 2006	25	The expansion of or changes to existing facilities for any process or activity, which requires an amendment of an existing permit or license or a new permit or license in terms of legislation governing the release of emissions, pollution, effluent.

Although the Basic Assessment process and Scoping/EIA process is applicable to the proposed development, it has been proposed that a Scoping/EIA process be undertaken. The proposed activity may not commence without Environmental Authorisation from the DEA.

6.2.2 Applicability of the EIA Regulations (2010)

The EIA Regulations (2010) were published in terms of the NEMA and came into effect on 2 August 2010. Section 75 and 76 of the EIA Regulations (2010) states that an application submitted in terms of the EIA Regulations (2006), and which is pending when the EIA Regulations (2010) take effect, must despite the repeal of the former, be dispensed with in terms of the former as if they were not repealed. Therefore, the EIA Regulations (2010) are not applicable to this application. In addition, if an activity that is listed under EIA Regulations (2006) does not form part of the EIA Regulations (2010), the DEA will consider the said activity to be withdrawn from the application. As such, the following activities of GNR No 386 of the EIA Regulations (2006) will no longer form part of this application, and will not be carried through to the EIA Phase:

14 The construction of masts of any material or type and of any height, including those used for telecommunication broadcasting and radio transmission, but excluding –

(a) masts of 15 metres and lower exclusively used:
(i) by radio amateurs; or
(ii) for lighting purposes
(b) flag poles; and
(c) lightning conductor poles.

16 The transformation of undeveloped, vacant or derelict land to –

(a) establish infill development covering an area of 5 hectares or more, but less than 20 hectares; or
(b) residential, mixed, retail, commercial, industrial or institutional use where such development does not constitute infill and where the total area to be transformed is bigger than 1 hectare.

6.3 NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT

The National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) [NEM:WA] regulates waste management in order to protect human and environmental health by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development. Additionally it provides for national norms and standards for regulating the management of waste by all spheres of government, providing for specific waste management measures to licensing and the control of waste management activities and remediation activities associated with contaminated land. This legislation provides for compliance and enforcement of the above requirements.

An application for development has to conform to the requirements of the NEM:WA and the regulations promulgated in terms of Section 19(1) thereof. The regulations promulgated under Section 19(1) are currently listed in GNR No. 718. All activities listed in the abovementioned regulations shall be subject to a Basic Assessment Process for Category A activities, or an EIA Process for Category B activities, and will require a Waste Management License. Section 20(b) of the NEM:WA prohibits the undertaking of identified waste management activities except by virtue of a licensing authority. A Waste Management License is managed and authorised by the Waste Management Department within the DEA. As such, one integrated EIA Process is undertaken, as prescribed by the NEM:WA, which will include the waste management activities as well.

6.3.1 Activities Applicable to the National Environmental Management: Waste Act

The construction of the power lines could lead to the potential relocation of settlements, resulting in the demolition of building structures. This would create building rubble that may require temporary storage of waste on-site. This waste generating activity could fall within the ambit of the listed activity presented in Table 6-2, identified in terms of Section 20 (b) of the NEM:WA.

Table 6-2: Listed activities in terms of the National Environmental Management: Waste Act

Number and date of the relevant notice	Activity No(s)	Description of each listed activity
National Environmental Management: Waste Act (59/2008): List of waste management activities that have, or are likely to have a detrimental effect on the environment, published under Government Notice 718 of 3 July 2008.	Category A (3) (1)	The storage, including the temporary storage, of general waste at a facility that has the capacity to store in excess of 100 m^3 of general waste at any one time, excluding the storage of waste in lagoons.

Therefore, the Waste Management License will only be required if the building rubble will amount to more than 100m^3 and if it is stored in one area for more than 90 days.

6.4 NATIONAL WATER ACT

The National Water Act, 1998 (Act No. 36 of 1998) [NWA] provides that water from a water resource may be used by any person for reasonable domestic use; continue using with an existing water use or may use such water in terms of a general authorisation or license issued in terms of the Act. Such water use is broadly defined and for the purposes of this report, includes the altering a watercourse, stream flow reduction activities, waste discharges and disposals and the removing of water found underground for certain purposes.

The NWA provides for tiered regulatory control over eleven water uses as identified in Section 21 of the NWA. After providing for the Ecological Reserve and international obligations, the basis for granting authorisation to use the available water quantity and/or quality in an area will be the achievement of beneficial use in the public interest. This is also referred to as "optimum use", i.e. use which achieves the most desirable combination of social, economic and environmental objectives, irrespective of whether such use is consumptive or non-consumptive. This includes the erection of towers and related construction activities, within the riverine and wetland environments.

Thus, a person who wishes to use, or who uses water in a manner that is not covered under Schedule 1, General Authorisations, or in a manner that is not regarded or declared as, an existing lawful use, may only use that water under the authority of a Water Use Licence. Therefore, the need exists to motivate and justify the use of water for power generation by Eskom.

The General Authorisations replaces the need for a water user to apply for a licence in terms of the NWA for the identified water uses, provided that the water use is within the limits and conditions set out in the General Authorisation. These General Authorisations are catchment and water use specific and should be dealt with on a case by case basis.

The Act also provides for pollution prevention measures with particular emphasis on water resource pollution. In accordance, the licensee shall ensure his activities impacting upon water resources and effluent releases are monitored for compliance with the applicable regulations. Emergency incidents involving water resources are included within the Act, requiring the polluter to remediate and mitigate the impacts of such an emergency incident.

6.4.1 Water Use Licence Application Process

The "Generic Licensing Process" highlights seven stages of a Water Use Licence Application. It is a phased approach, which is essential to consider and follow ensuring that an applicant of a water use licence is assured of the correct process to follow, determines the validity of the application, and the level of detail required for motivation of the water use. Without the phased approach the applicant runs the risk of expending unnecessary time and effort on aspects not required or worse certain critical aspects are missed.

a) Application

Pre-application liaison should take place with the relevant departmental officials and a lead regional office and officer should be identified. In this instance the Western Cape Regional Offices. Furthermore, the initial formal water use licence application forms must be completed and payment (R114.00) to the regional offices made to initiate the tracking process for the application.

b) Validation

During the initial contact with the regional offices and after submitting the formal water use licence application forms the validity of the application against legal requirements, determining the type of water use authorisation, and checking the completeness of provided information are also undertaken and confirmed.

c) Pre-position Information

During this stage, an evaluation is made of the available information and whether this information is sufficient to support the motivation and justification of the water uses applied for.

The above phases are normally captured in an "Initial Assessment Report" that is submitted to the DWA. The applicant only continues with the next phases after confirmation is received from DWA.

Based on the feedback of the DWA a final Integrated Water Use Licence Application could then be submitted, incorporating the results of detailed investigations of the potential impacts that the proposed water use could have on the water resources, including Section 27 requirements. The revised formal water use licence application forms, if changed, should be re-submitted.

6.4.2 Section 27(1) Requirements

The NWA includes considerations set out in section 27(1) that must be applied in the assessment of licence applications for water use. Although the Act states that this is a DWA responsibility, the applicant should supply the "minimum" information required in terms of section 27(1) to allow the Department to evaluate the application.

6.4.3 Technical Information in Support of Integrated Water Use Licence Application

To enable the DWA to prepare a water use licence, specific water use details are required. This information should be captured in the formal water use licence application forms and elaborated on in the initial assessment and final reports. Information such as title deed numbers on which the water use take place, water abstraction points (co-ordinates), water discharge points (co-ordinates), volume of water abstracted per day as an average and a peak quantity on any day, and water quality of final effluent to be discharged.

It should be noted that not only the consumptive use of water should be described but the general management of storm water, storage of raw materials, disposal of waste material from the construction site and drilling liquid should be described. Best practice should be used as norm for these management measures.

6.4.4 Activities Applicable to the National Water Act

Construction related activities shall impact upon water resources requiring the issue of a license for such activities in accordance to Section 21 of the NWA. The listed activity in terms of the NWA is presented in Table 6-3.

Table 6-3: Listed activities in terms of the National Water Act

Number and date of the relevant notice	Activity No(s)	Description of each listed activity
General Authorisations In Terms Of Section 39 Of The National Water Act, under Government Notice 26187 of 26 march 2004.	21 (c)	Impeding or diverting the flow of water in a watercourse.
	21 (f)	Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit.
	21 (i)	Altering the bed, banks, course or characteristics of a watercourse.
	21 (j)	Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people.

6.5 NATIONAL HERITAGE RESOURCES ACT

The National Heritage Resources Act, 1999 (Act No. 25 of 1999) [NHRA] directs the protection and management of the heritage resources in South Africa. This legislation serves as guidelines to the heritage resource management authorities in South Africa which developers and other authorities must exercise their discretion or take decisions in terms of this Act. The NHRA applies to the actions of the State, local authorities and private individuals.

National Estate includes, but is not limited to, places, buildings, structures and equipment of cultural significance, places to which oral traditions are attached or which are associated with living heritage; historical settlements and townscapes, landscapes and natural features of cultural significance, geological sites of scientific or cultural importance, archaeological and paleontological sites, graves and burial grounds, sites of significance relating to the history of slavery in South Africa and movable objects.

A variety of formal protection measures, ranging from national and provincial heritage sites, protected areas, provisional protection, inclusion on the heritage register of a province, heritage areas and heritage objects have been included in the NHRA. A number of other protection measures, including the legal protection of paleontological and archaeological sites (including rock art) and meteorites, burial grounds and graves, structures older than 60 years and public monuments and memorials are also in place.

Applicants must contact the South African Heritage Resource Agency (SAHRA) to ascertain which properties and objects are formally protected by the Act and how any future development would impact on these heritage resources. Applicants should

note that formal permit applications or authorisations would be required from the relevant heritage resource management authority to make changes to these heritage resources.

Applicants must note that the provisions of Section 38 of the NHRA provides that they have the responsibility to contact the SAHRA at the very earliest stages of initiating a development and furnish the SAHRA with details relating to the proposed development in order for them to determine if a Heritage Impact Assessment (HIA) is required. Please refer to Section 9.2.5 for the terms of reference of the HIA to be conducted in the EIA Phase.

6.6 HAZARDOUS SUBSTANCES ACT

The Hazardous Substances Act, 1973 (Act 15 of 1973) provides for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances, and for the control of certain electronic products. The Hazardous Substance Act further provides for the division of such substances or products into groups in relation to their degree of danger. The Act also provides for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances and products.

6.7 OTHER APPLICABLE ENVIRONMENTAL LEGISLATION

A limited scoping of relevant legislation was undertaken in order to identify only the key legal issues related to the proposed project. Applicable key environmental legislation, which must be considered by Eskom Holdings Limited during the implementation of the proposed project is summarised in Table 6-4.

Table 6-4: Summary of Applicable Legislation

Legislation	Sections	Relates to
The Constitution Act (No 108 of 1996)	Chapter 2	Bill of Rights
	Section 24	Environmental rights
	Section 25	Rights in property
	Section 32	Administrative justice
	Section 33	Access to information
National Environmental	Section 2	Defines the strategic environmental management goals, principles

Legislation	Sections	Relates to
Management Act (No 107 of 1998) as amended		and objectives of the government. Applies through-out the Republic to the actions of all organs of state that may significantly affect the environment
	Section 24	Provides for the prohibition, restriction and control of activities which are likely to have a detrimental effect on the environment.
	Section 28	The developer has a general duty to care for the environment and to institute such measures as may be needed to demonstrate such care.
	Section 30	Emergency incidents. Responsible persons duties
National Environmental Management: Protected Areas Act (No 57 of 2003)	The Act came into operation on 1 November 2004. The aim of the Act is to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity, natural landscapes and seascapes. In 2004, the National Environmental Management: Protected Areas Amendment Act 31 of 2004 was promulgated to amend Act 57 of 2003 with regard to the application of that Act to national parks and marine protected areas. The NEM: Protected Areas Amendment Act was published for public information on 11 February 2005 and came into operation on 01 November 2005. The NEM: Protected Areas Act, as amended by the NEM: Protected Areas Act 31 of 2004 repeals sections 16, 17 & 18 of the ECA as well as the National Parks Act with the exception of section 2(1) and Schedule 1.	
National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) (NEMBA),	Sections 65-69	These sections deal with restricted activities involving alien species; restricted activities involving certain alien species totally prohibited; and duty of care relating to alien species
	Sections 71 and 73	These sections deal with restricted activities involving listed invasive species and duty of care relating to listed invasive species.
Conservation of Agricultural Resources Act (No 43 of 1983) and regulations	Section 5, 6	Implementation of control measures for alien and invasive plant species.
National Water Act (No 36 of 1998) and regulations	Section 19	Prevention and remedying the effects of pollution.
	Section 20	Control of emergency incidents
	Section 21	DWA will require water use licences for various construction related activities.
	Section 26 and 34	Registration of water use regarding the discharging of waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit and disposing of waste in a manner which may detrimentally impact on a water resource.
National Heritage Resources Act (No 25 of 1999)	Section 35	No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site.
	Section 36	No person may, without a permit issued by the South African Heritage Resource Agency (SAHRA) or a provincial heritage resources authority destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority. "Grave" is widely defined in the Act to include the contents, headstone or other marker of such a place, and any other structure on or associated with such place.
	Section 38	This section provides for Heritage Impact Assessments (HIA), which are not covered under the ECA. The HIA will be approved

Legislation	Sections	Relates to
		by the DEA, which is required to take SAHRA's comments into account prior to making a decision on the HIA.
Removal of Graves and Dead Bodies Ordinance 7 of 1925	Authorization for exhumation and reinternment of human remains must be obtained from the relevant local authority where the grave is situated, as well as where the grave is being relocated to.	
Atmospheric Pollution Prevention Act (No 45 of 1964) and regulations	Section 9	Control of offensive gasses
	Sections 15, 16, 18, 20, 23	Pollution by smoke
	Sections 27- – 35	Dust control
	Section 36 - 40	Air pollution by fumes emitted by vehicles
National Environmental Management: Air Quality Act (No 39 of 2004)	Section 32	Control of dust
	Section 34	Control of noise
	Section 35	Control of offensive odours
	Chapter 5	Licensing of listed activities
	Schedule 2	Ambient air quality standards
National Environmental Management: Waste Act (No. 59 of 2008)	Section 20	No person may commence, undertake or conduct a waste management activity, except in accordance with: • the requirements or standards prescribed by said Act and regulations; and • a waste management licence issued in respect of that activity, if a licence is required.
South African National Roads Agency Limited and National Roads Act, 1998 (Act No. 7 of 1998): 1. Damaging of a National Road	Section 46(3)	The owners or occupiers of land adjoining any national road must: • take all measures on their land that are reasonable necessary to prevent the occurrence of any damage to the national road concerned. • Refrain from doing or permitting anything on or below the surface of that land which is likely to cause damage to that national road.
	Section 46(4)	The owner or occupier of any land adjoining a national road will be held liable for any damage to the national road which was or reasonably should have been foreseen.
	Section 5(a) and (b)	The Agency may issue a written notice demanding that the owner or occupier prevents or stops any activity that may cause damage to a national road. The demand may include, among others, the removal, filling in, alteration, relocation or establishment of any dam, canal, trench, wall, sluice, pipe, excavation, structure or other works, or the cessation of such an act, on the land.
South African National Roads Agency Limited and National Roads Act, 1998 (Act No. 7 of 1998): 3. Structures and other works on, over or below national roads or certain other land	Section 48(1)	No person may do any of the following without the Agency's permission: • On or over, or below the surface of, a national road erect, construct or lay, or establish any structure. • Make any structural alteration or addition to a structure situated on or over, or below the surface of a national road. • Give permission for either (a) or (b).
	Section 48(5)	The Agency may give written notice for the removal of any such structure, or may remove the structure and recover the costs from that person.

Legislation	Sections	Relates to
	Section 48(8)	Any person who contravenes this section is guilty of an offence and liable to one year in prison and/or a fine.
Explosives Act (Act 15 of 2003) and regulations	Provisions for the control of explosives in terms of use, disposal, storage, transportation, dealing, importation, exportation and packaging of explosives.	
Occupational Health and Safety Act (No 85 of 1993) and regulations	Section 8	General duties of employers to their employees.
	Section 9	General duties of employers and self employed persons to persons other than their employees.
Fencing Act (No 31 of 1963)	Section 17	Any person erecting a boundary fence may clean any bush along the line of the fence up to 1.5 metres on each side thereof and remove any tree standing in the immediate line of the fence. However, this provision must be read in conjunction with the environmental legal provisions relevant to the protection of flora.
Hazardous Substances Act (No 15 of 1973) and regulations	Provides for the definition, classification, use, operation, modification, disposal or dumping of hazardous substances.	
Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act (No 36 of 1947) and regulations	Sections 3 to 10	Control of the use of registered pesticides, herbicides (weed killers) and fertilisers. Special precautions must be taken to prevent workers from being exposed to chemical substances in this regard.
National Road Traffic Act (No 93 of 1996) and regulations	Section 54	Transportation of dangerous goods.
National Veld and Forest Fire Act (No 101 of 1998)	Chapter 2	Promotes and regulates the formation of fire protection associations which aim to manage and coordinate fire protection and fire services in an area.
	Chapter 4, 5	Organizations are required to make and maintain firebreaks and fire fighting equipment and personnel should a risk exist that a fire may start or spread from the premises.

6.8 BY-LAWS APPLICABLE

The CoCT by-laws that may be applicable to the proposed development is presented in Table 6-5.

Table 6-5: By-laws applicable

Legislation	Section	Relates to:
CoCT Air Pollution Control By-Law, GG5979, LA 12649, 4 February 2003	Duty of Care	This section calls upon everybody to exercise duty of care to prevent air pollution from occurring. Pollution must be mitigated to remedy air pollution. Failure to do this may empower the Council to take serious steps against that person.
	Declaration of Air Pollution Control Zone	The whole area within the jurisdiction of the Council is declared an air pollution control zone. The Council has power within the control zone to issue notices in the provincial gazette to prohibit and restrict activities that may

Legislation	Section	Relates to:
		pollute air.
	Smoke emissions from premises other than dwellings	Dark smoke may not be emitted for an aggregate period exceeding three minutes during a continuous period of thirty minutes. Installation, alteration, extension or replacing of fuel burning equipment must be authorised by the Council. Operation of fuel burning equipment without the Council's authorisation is an offence. The owner or occupier of premises may be required to install at own costs the obscuration measuring equipment. Records and monitoring results must be kept and maintained.
	Emissions caused by open burning	Open burning of any material without a written authorisation by the Council is an offence.
	Emissions from compressed ignition powered vehicles	Vehicles using compressed ignition power and emitting dark smoke may not be used.
	Emissions that cause a nuisance	Emissions that cause a nuisance are an offence. An abatement notice may be served on any person who is or likely to cause air pollution to abate the nuisance, prevent it and comply with conditions set in the notice.
CoCT Water By-Law, Gazette No. 6378, 1 September 2006	Section 10	**Duties of the public** All members of the public must upon becoming aware of any emergency or situation that may give rise to wastage of water or water pollution, immediately inform the Director: Water.
	Section 14	**Offences and penalties** Any person who contravenes or fails to comply with any provision of these by-laws will be guilty of an offence and may be liable, upon conviction, to a fine.
	Section 18	**Unauthorised use of water** No person may use water from the water supply system without an agreement with the municipality and only through a communication pipe and metered water supply point installed by the municipality.
	Section 42	**Wastage of water** No person may cause or permit the wastage of water such as permitting leaking pipes or insufficient use of water.
	Section 43	**Water conservation and demand management** All consumers of water must comply with the good water conservation and demand management practices.
	Section 59	**Prevention of pollution of water** An occupier of premises must prevent the entry of any substance which may be a danger to health or adversely affect the potability of water into the water supply system or an part of the water installation on his/her property.
	Section 62	**Wells, wellpoints, boreholes and excavations** An owner of premises on which there is a well, wellpoint, borehole or any other excavation must ensure that it does not create a health nuisance or is filled in a way or with material which may cause an adjacent well, borehole or underground source of water to become polluted.
	Section 64	**Supply of non-potable water by the municipality** Non-potable water supplied by the municipality may not be used for domestic purposes or any other purpose which

Legislation	Section	Relates to:
		may give rise to a health hazard.
	Section 66	**Warning notices** Sources of non-potable water must be clearly marked with a weatherproof notice.
Fire Safety By-Laws, 28 February 2002	Section 26	Combustible waste and refuse
	Section 34	Combustible material fire hazards
	Section 37	Storage and use of flammables
	Section 48	Reporting of accidents
CoCT Environmental Health By-Laws, LA13333, 30 June 2003		• Land open to the public may not be used for the purpose of storing and stacking or for keeping any material likely to cause a health nuisance. • No premises may be allowed to be overgrown with bush, weeds or grass to such an extent that it may be used as a shelter by vagrants, wild animals or vermin which may threaten public health or safety. • The sanitation system on any premises may not be of such nature or condition that it may cause a health nuisance. • No person may commit any act which may cause a public health nuisance. • No person shall occupy any premises for habitable purposes so as to be a health nuisance. • No factory or trade premises may cause or give rise to smells that will cause a health nuisance. • The occupier of premises must take all possible measures to prevent the occurrence of mosquitoes, flies, fleas, bugs, cockroaches or other vermin or pests. • Filth, rubbish, refuse, manure or any material likely to be a health nuisance may not be kept or deposited on any premises. • Any person who fails to comply or contravenes with any provision of Section 1 of these by-laws will be guilty of an offence and may be liable to a fine. • Medical waste must be handled and stored in a safe manner that poses no threat to human health or the environment. • Any person convicted of an offence under these by-laws shall be liable to a penalty.
CoCT Storm water Management By-Laws , LA 31420, 23 September 2005	Prohibited discharges	No person may discharge anything but storm water into the storm water system without written consent from the Council.
	Protection of storm water system	No person may commit any act which may damage, endanger or destroy the storm water system or interfere with the operation thereof or contaminate or pollute the water therein without the written consent from the Council.
	Prevention of flood risk	No person may undertake any activity which may cause an increase in flood levels or create a potential flood risk without the written consent from the Council.
	Studies and assessments	The Council may require that an environmental impact study may be done for an activity named in sections 3, 4 and 5.
	Water pollution incidents	Should a storm water pollution incident occur, the owner of the property on which the incident took place or the person

Legislation	Section	Relates to:
		responsible for the incident must inform the Council of the incident immediately and take all reasonable measures to minimize the effects of the pollution.
	Storm water systems on private land	Every owner of property on which a private storm water system is located may not carry out an activity which may cause the system not to function properly. The owner must also keep such storm water system functioning properly.
	Offences and penalties	Any person who contravenes or fails to comply with any provision of these by-laws will be guilty of an offence and may be liable, upon conviction, to a penalty.
CoCT Public Places and Nuisances By-Laws	Section 2	**Prohibited Behaviour** No person may intentionally block or interfere with the safe and free passage of a pedestrian or vehicle.
	Section 6	**Trees causing an interference or obstruction** The City may give notice to the owner or occupier of any property on which there is any tree or other growth which interferes with overhead wires or is a source of danger or nuisance to persons using a public road to prune or remove the tree or growth.
	Section 8	**Goods, building materials, motor vehicle wrecks and dangerous objects** No person may cause any broken glass or other potentially dangerous objects to be placed in a public place.
	Section 23	**Offences and penalties** Any person who contravenes or fails to comply with any provision of these by-laws will be guilty of an offence and may be liable, upon conviction, to a fine.
CoCT Wastewater and Industrial Effluent By-Laws GN 6378, 1 September 2006	Section 2	**Duties of owners of properties** Owners of premises must construct their own private sewer installations on their premises.
	Section 3	**Protection of municipal sewers** No person may interfere with the municipal sewer system in any way or discharge into the system any substance other than sewage without the approval of the council.
CoCT Integrated Waste Management By-Law, 2009	Section 4	**Obligations of Waste Generators** A waste generator must: • "avoid the generation of waste or where it cannot be avoided minimise the toxicity and amounts of waste generated"; • "re-use, recycle or recover waste where possible"; • "manage waste so that it does not endanger health or the environment or create a nuisance"; • "maintain suitable cleanliness and hygiene standards on their premises as required by the City's Environmental Health By-law"; • "conclude a contract with the City, its service provider or an accredited service provider, as the case may be, for the storage and collection of waste". A waste generator generating industrial waste shall submit an integrated waste management plan to the City and comply with the terms and conditions set out by the City for the generation, minimisation, storage, recycling, collection and disposal of such waste.

Legislation	Section	Relates to:
		Any person who directly or indirectly generates building waste or the owner of the property on which such building waste is generated shall not store such waste in containers provided by the City for residential waste and shall remove and dispose of it at a licensed crushing plant or landfill site or any other licensed building waste disposal facility. The waste generator or the owner of the property on which waste is generated who deposits or stores waste on property of the City may be fined for failure to have or produce a permit for such deposit or storage.
	Section 7	**Priority Waste** Where special measures are required for management of waste because it poses a significant threat to health or the environment, it is not biodegradable, contains or could foster pathogens or communicable diseases or has been declared a priority waste in terms of other applicable legislation it can be prioritised according to this By-law.
	Section 12	**Storage and Transportation of Waste** Any person who stores or transports waste must ensure that: • "suitable measures are in place to prevent accidental spillage or leakage"; • "the waste cannot be blown away"; • "nuisances such as odour, visual impacts do not arise"; and • "pollution of the environment and harm to health are prevented".
		Prohibition of Unauthorised Disposal of Waste No person may: • Dispose of waste in a manner likely to cause pollution or have a negative impact on the environment or to be harmful to health; • Dispose of waste other than in accordance with this By-law or National and Provincial legislation; • Burn waste, especially hazardous waste except in approved incinerators; • Deal with waste in a manner that causes dust, spillage or litter.

6.9 POLICIES AND GUIDELINES

A section of the proposed study area is intersected by the CoCT Scenic Route Study (MCA Urban & Environmental Planners, 2002). The affected section is from the intersection of Baden Powell Drive along the N2 to Firgrove Substation. Table 6-6 lists the concerns and recommended policies for utility service within the study area that is affected by the Scenic Route Study, more specifically, the electrical infrastructure.

Table 6-6: Scenic Drive Management Policy for Utility Services (MCA Urban & Environmental Planners, 2002)

Concern	Assessment	Recommended Policy Guidelines
The location and routing of electrical pylons and substations which form part of the national grid frequently have adverse visual impacts.	It is evident that the location of these activities takes advantage of excessive road reserves and that space availability, rather than visual criteria, determine their location.	• Electrical overhead cables should be relocated underground. • The policy and management guidelines identified for scenic routes should be taken into consideration when the required EIA's are prepared for large-scale space extensive and highly visible utility facilities.

A synthesis of the issues identified as part of the CoCT Scenic Route Study (MCA Urban & Environmental Planners, 2002) states that this section of the study area is a significant scenic route and is an important access route into Cape Town. The filling station along the N2 is visually intrusive and this is exacerbated by the out-of scale brand name sign boards.

The following projects have been proposed as part of the CoCT Scenic Route Study (MCA Urban & Environmental Planners, 2002):

- Investigate alternative measures to provide safe pedestrian facilities for crossing the N2 at Macassar and Firgrove.
- Consider measures to counter potential safety threat posed by the close proximity of the trees to the road at Macassar.

6.10 EIA GUIDELINE DOCUMENTS

The following guideline documents have been considered during the process:

- DEAT (2006a) Guideline 3: General Guide to Environmental Impact assessment Regulations 2006, Integrated Environmental Management Guideline Series, Department of Environmental Affairs and Tourism (DEAT), Pretoria.
- DEAT (2006b) Guideline 4: Public Participation, in support of the EIA Regulations 2006, Integrated Environmental Management Guideline Series, Department of Environmental Affairs and Tourism (DEAT), Pretoria.
- DEAT (2006c) Guideline 5: Assessment of Alternatives and Impacts in support of the Environmental Impact Assessment Regulations 2006, Integrated Environmental Management Guideline Series, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

6.11 AUTHORITY INCEPTION MEETING

An inception meeting was held with Mr. Reggie Nkosi and Ms. Tebogo Mapinga from the DEA on the 9 March 2010 (refer to Appendix A for the minutes). The purpose of this meeting was to provide background to the proposed projects and to discuss the EIA requirements, specifically the separation of the EIA process with a common Public Participation Process (PPP). This necessitates the initial separate submission of the application forms, from where the appointed DEA case officer would determine the acceptance of a single EIA report or separate EIA reports for the project.

6.12 POST APPLICATION MEETING

A post application meeting was held with Mr. Takalani Maswime, Ms. Gabisilie Hlogwane and Ms. Tebogo Mapinga from the DEA on the 19 April 2010 (refer to Appendix A for the minutes). The purpose of this meeting was to clarify issues identified for the proposed projects and to discuss issues associated with the project.

7. DESCRIPTION OF ANTICIPATED ISSUES

The purpose of the scoping study is to identify, record and describe the issues that have been raised by the stakeholders and specialists with regards to the proposed development. This enables the EIA Report to be clearly focused and provides a framework for the impact assessment of the proposed development on the environment, and of the environment on the proposed development.

From these various sources, environmental (biophysical, social, cultural-historic and economic) issues have been identified and will be investigated during the EIA phase. Specialist studies will address some additional issues for completeness.

7.1 CONSTRUCTION-RELATED IMPACTS

The impacts from the construction of the proposed development will only be for the duration of the construction phase and should be limited to daylight hours. During the construction phase overall activity within the study area will be increased. The placement of the construction site office will be within the site demarcated for the proposed development and access will be gained from designated routes only. Investigations will be made into the placement of a construction camp to accommodate the construction workers. The contractor(s) will need to comply with all security measures detailed by Eskom Holdings Limited.

Activities during construction, such as driving on gravel roads, the clearing of vegetation, construction of access roads and the excavations for the towers will generate windblown dust. For all the afore-mentioned, it should be noted that the construction period is for a relatively short time and that any potential impacts associated with construction will be temporary in nature.

7.1.1 Waste-Related Impacts

The construction of the Transmission power line may result in the demolition or relocation of existing structures. In the event that structures are demolished, such demolition shall result in large volumes of waste produced (beyond the threshold prescribed in the NEM:WA). Therefore, the storage of waste on-site (including temporary storage of up to 90 days) and subsequent disposal at a registered landfill site may require a Waste Management Licence (refer to Section 6.3).

7.1.2 Air Quality

Air quality has been identified within the CoCT as a concern and priority issue. This has resulted in the air quality within the study area being continuously monitored as part of the Air Quality Management Programme of the CoCT (2007a).

Air pollution in the study area is mostly caused by the burning of fuel wood for heating and cooking purposes in the residential areas; as well as industrial and dust emissions within the industrial and commercial areas.

According to CoCT (2007a), atmospheric pollutants within the study area of the proposed development contributed to unacceptably high atmospheric pollution levels, e.g. the air pollution levels for more than 150 days in 2006 were higher than internationally accepted standards. These levels were compounded by the extremely low "temperature inversion layer" as experienced during the winter months (CoCT, 2007a).

7.1.3 Geotechnical Impact

The Quaternary Deposits generally comprise sandy soils and are located in approximately 93% of the study area for alternative route alignments A and B, and the entire study area for alternative route alignments C and D. Much of the expected settlement in these soils will be elastic/immediate settlement, which will occur during construction. However, these soils are prone to collapse settlement and are termed collapsible soils. A collapsible soil is a partially saturated material, which exhibits additional settlement upon wetting up. This generally occurs without any increase in applied pressure. Structures founded on collapsible material may exhibit no signs of distress for many years until an inundation of some sort occurs and produces sudden, unexpected settlement. This sudden settlement is associated with a change in soil structure. Essentially, the soil structure collapses in on itself thereby inducing the potential impact of the settlement of sandy soils. In addition, these Quaternary sands are generally unconsolidated and hence have a relatively low *in situ* bearing capacity.

Occasionally peaty soils are evident in the Springfontyn Formation. Should these peaty soils be encountered, it is likely that they will be highly compressible and that there will be a shallow water table associated with their occurrence. It is possible for peat to compress to as little as 10% of its original volume under load. Water from peat deposits is usually highly acidic and aggressive to concrete. When the water

table is lowered and the peat is allowed to dry out, spontaneous combustion may occur. Hence, the potential impact that can occur is spontaneous combustion of peaty soils.

The Malmesbury Group is characterised by variations in rock type. These variations often occur within a very short distance such that there may be a variation under individual foundations. In addition, the rocks are often very steeply dipping and this can lead to problems when excavating for foundations as there may be a potential impact of instability within the sidewalls, should the excavation intercept unfavourably dipping rock.

The residual soils formed by the *in situ* weathering of the Malmesbury Group are variable in composition. However, the soils generally comprise stiff silts and clays which are generally not expansive. Furthermore, the transported soils derived from the residual Malmesbury soils have been found to be expansive. Therefore, the expansive nature and the instability in excavations of residual Malmesbury soils are identified as potential impacts.

Instability in excavations through the residual Malmesbury soils has been noted. This is probably due to the silt/clay composition, which may be affected by the relict bedding, which may form steep surfaces along which "release" surfaces may form. This is aggravated by the presence of a shallow water table or seepage.

The granite and granitic rocks of the Cape Granite Suite weather to silts and clays along the coastal region as the weathering has been mainly chemical. Occasionally small pockets of expansive soils are found, but this is not a common feature of the soil.

7.1.4 Impact on Soil

The soils of the study area are generally sandy, freely drained, but lacking somewhat in fertility. Where subsoil clay horizons occur, water logging of these soils is a potential impact.

7.1.5 Impact on Agriculture

It is known that Eskom allows agricultural activities to be exercised within the servitude area of power lines as long as the agricultural crops and equipment do not touch the power lines; the maximum operational height under the tower conductors is 5.5m. The potential impact of the proposed power lines on crop production has been identified and as such, farmers could oppose that power lines intersect their farms.

The agricultural potential sites of the alternative Mitchell's Plain Substation sites will depend on the quantity and quality of groundwater on these sites as well as the potential low agricultural potential of the soils.

7.1.6 Impact on Groundwater

There is concern, especially in densely populated areas, regarding the vulnerability of the Cape Flats Aquifer to pollution. An inherent contamination problem in coastal aquifers is a function of the porous nature of the aquifers and their proximity to the sea. The aquifer may extend below sea level, thus over-abstraction and mismanagement of the groundwater can result in saline water intrusion into the fresh water zone of the aquifer. Careful control of abstraction rates is thus essential in such circumstances to preserve the potability of the groundwater.

7.1.7 Impact on Wetlands

There are four (4) wetlands that may affect Alternatives A and B between Firgrove and Mitchell's Plain and three (3) wetlands that may affect Alternatives C and D. Table 7-1 indicates the extent of the wetland functions, i.e. it is the area that is positively impacted by the wetland functions. This is influenced by the wetland's surroundings and its connectivity to other water sources.

Table 7-1: Wetland functioning

Plant Community	Wetland Functioning	Potential Impact of Wetland Functioning
Firgrove Wetland	Nitrate and toxicant removal	Wetland is not connected to other water sources
Airstrip Wetland	Nitrate and toxicant removal and erosion control	Wetland is not connected to other water sources
Buffelsvlei	Nitrate and toxicant removal and erosion control	Wetland receives water from the Kuils River and drains into the sea

Plant Community	Wetland Functioning	Potential Impact of Wetland Functioning
Khayelitsha Wetland	Nitrate and toxicant removal and erosion control	Wetland is not connected to other water sources.
Stikland Wetland	Nitrate and toxicant removal and erosion control	Wetland is not connected to other water sources due to habitat fragmentation.
Kuils River wetland	Flood attenuation, sediment and phosphate trapping, nitrate and toxicant removal, erosion control, maintenance of biodiversity	Wetland received water from a large catchment, drains into the Buffelsvlei and then into the sea.
Mitchell's Plain wetland	Nitrate and toxicant removal and erosion control	Wetland is not connected to other water sources due to habitat fragmentation.

In addition, the Eerste River drainage line has been identified as a potential impact according to CoCT (2002). Therefore, this will be investigated in further detail within the EIA Phase.

Although the ecological status of the Buffelsvlei is only intermediate it is a wetland that performs important functions over a large extent. The dense residential developments further north increased the water entering the Buffelsvlei, and it also potentially affected the water quality. The *Phragmites australis* and *Typha capensis* growing densely in the Buffelsvlei performs important functions in the purification and regulation of storm water before it drains into the sea.

The possible wetland areas where Transmission pylon towers could be erected will be investigated in the EIA Phase.

Portions of the site for the proposed Mitchell's Plain Substation Alternative 1 and 2 have been identified as potential wetlands. This will be investigated further during the EIA Phase.

7.1.8 Impact on Ecology

The Driftsands Nature Reserve is an area of concern, because it is the only section along the route that represents the Cape Flats Dune Strandveld. Some potential impacts such as destruction of the vegetation cover and over-utilisation are visible in localised areas of the nature reserve. Few alien species are found in this nature reserve.

The potential for any Red Data Species to be within the study area is not identified as an issue of concern because of the fragmentation of the habitat within the study area.

Alternative 1 for the proposed Mitchell's Plain substation is located in an area that is covered exclusively by the alien invasive plant, *Acacia saligna*. All alien species have a certain degree of impact on the biodiversity of the ecosystems and as such poses a threat to the natural biodiversity of the fynbos biome. The impact of *Acacia saligna* and *Pennisetum clandestinum* is extensive and in some areas these species have replaced the natural vegetation entirely.

Alternative 2 for the proposed Mitchell's Plain substation is located in a potential wetland area, and is discussed in Section 7.1.7.

The Driftsands Nature Reserve, where Alternative 3 of the proposed Mitchell's Plan Substation is located, is situated opposite informal settlements in Khayelitsha, and the area is therefore exposed to impacts from human activities, which is apparent in localised sections of the reserve. The Driftsands Nature Reserve is not fenced, resulting in various footpaths prevalent due to the easy access. The nature reserve is also used for illegal waste dumping and cows were seen to be grazing in certain sections. The original fynbos vegetation has largely been replaced by grass species such as *Eragrostis curvula*, *Pennisetum clandestinum* and *Lagurus ovatus* (refer to Section 5.8.4).

7.1.9 Impact on Avifauna

During the construction phase, avifaunal impacts are limited to disturbance and habitat destruction. Refer to Section 7.2.1 for impacts identified during the operational phase.

a) Disturbance

Similarly, the abovementioned construction and maintenance activities impact on birds through disturbance, particularly during breeding activities. The potential exists for the impact of disturbance to influence a greater area than the site itself, in that it could result in breeding failure of birds breeding close to the construction activities. It is however foreseen that disturbance will be a temporary impact. This impact will be further investigated during the next phase of the study.

b) Habitat Destruction

During the construction phase of power lines and particularly substations, habitat destruction and alteration inevitably takes place on the site. This happens with the construction of access roads, the clearing of the site itself and any associated infrastructure. The power line servitude has to be maintained free of any natural vegetation, to minimize the risk of fire amongst other reasons. These activities have an impact on birds using the servitude and substation site for breeding, foraging and roosting. The proposed substation site will entail the clearing of vegetation, which could have an impact on birds occurring there.

Due to the identified potential impacts identified in the study area (even in officially protected areas such as Driftsands Nature Reserve), namely urbanisation (both formal and informal), industrialisation, agriculture, alien infestation and illegal dumping in open spaces, the clearing of vegetation could potentially have an effect on bird habitat. All the proposed substation sites show evidence of the above potential impacts to a greater or lesser degree. This aspect will require further investigation in the next phase of the study.

7.1.10 Socio-economic Impacts

The following potential socio-economic impacts have been identified for the construction phase of the project:

a) Employment

- Limited employment opportunities could be created during the construction phase of the project which could have some short-term positive impacts, especially in the area with its high unemployment rates.
- Because of the unemployment profile of the population in the area and the existing in-migration pattern, the inflow of jobseekers could be likely.

b) Inflow of workers

- An inflow of workers to the area and the associated construction activities (vehicle movement, noise, dust) could result in temporary intrusion impacts.

- Littering by workers could be raised as a concern and could materialise as a negative cumulative impact, as littering and illegal dumping are already major sources of pollution throughout the study area.

c) Safety and security

- Safety and security impacts refer to the increased risks of veld fires in the open space areas, because of construction worker practises (e.g. cooking and heating), the increased risk of vehicular and pedestrian accidents because of construction vehicle movements, general risks related to construction activities (e.g. electrocution, risks of falling from working heights etc.), as well as the perceived increase in crime because of outsiders being in the area.

d) Disruption in daily living and movement patterns

- During the construction of the Transmission power line and substations, temporary disruptions in the daily living and movement patterns of property owners and school learners (e.g. schools in close proximity to the construction areas) could be foreseen.

e) Health related Impacts

- Health related impacts during the construction phase of the proposed project are associated with the influx of outsiders to the area, whether these are job seekers or construction workers. The spread of HIV/Aids, with long-term possible regional consequences, is always a source of concern, but especially with the high prevalence rate of HIV/Aids in the area.
- Inadequate accommodation for job seekers and workers could also result in health risks because of pollution of water, improper waste management, etc.

f) Change in commercial and industrial focus

- It is not expected that there would be a direct impact on the economic activities undertaken in the study area and no change in the commercial and industrial focus of the suburbs are expected. However, should the project not be implemented, more industries would be without power, thus potentially having a cumulative impact on the economic activities within the study area.

g) Impact on sensitive receptors

- The proximity of various schools and hospitals to the proposed alignments throughout the study area should be considered as it is not ideal to construct power lines in close proximity to such sensitive receptors.

7.1.11 Impact on Heritage Resources

The Transmission power lines will consist of overhead cables suspended from towers placed 400-500 m apart (or as needed). Each steel tower will need to be mounted on concrete footings set into the ground surface. Hence each point of land surface disturbance is confined to the few square meters of the tower bases. The actual servitude will require a service road (normally an unpaved track) while the corridor will have to be cleared of tree cover and structures. During construction the landscape will be subject to a period of temporary disturbance when construction equipment is brought onto site for building of the towers and lifting of the cables.

Heritage sites can be negatively affected through disturbance of the land surface, destruction of significant structures and places as well as any action that will alter the feel and appearance of an historic place or building.

Archaeological and palaeontological impacts are not a major concern in either study area as few are known to exist on the Cape Flats, and secondly they are not visually sensitive.

a) Driftsands Nature Reserve

Impacts to heritage material and structures at Driftsands are unlikely as surveys of the area have revealed very little. The essence of the impact that could result is visual in character that the encroachment of electrical infrastructure is an erosion of potential sense of wilderness (if this can ever be re-established). It must be considered that although the reserve is run-down and scruffy, partially invaded by informal settlements. It is the subject of a study by the CoCT to upgrade it and develop it as a multi-purpose urban reserve in order to further its conservation as a unique remnant.

b) Vergenoegd Wine Estate

Alternative A runs about 700m from the historic precinct which means that the lines will be visible (landscape is flat) and possibly moderately intrusive, especially from the entry point of the estate. Alternative B lies on the south side of the N2 and will not be visible.

c) Zeekoeivlei Historic Site

Due to the aesthetic value of the homestead, combined with the fact that the building is in such good condition make it highly conservation-worthy. Alternatives A and B will pass 250m east of the buildings as they enter in towards the Firgrove substation. Therefore, a potential visual impact is expected.

d) Zewenwacht Wine Estate

A cautionary approach is issued with respect to Alternative D, which may potentially impact the aesthetics of this important heritage site (note that aesthetics as an element of culture are protected under the NHRA). Positioning of the Transmission power lines east of the existing power line corridor in this area will result in negative impacts to the landscape aesthetics.

7.1.12 Impact on Traffic

Potential traffic impacts relate primarily to the anticipated increase in vehicle usage of provincial and district roads, in particular, by heavy vehicles. This includes material delivery vehicles and vehicles that will travel daily to and from the construction camp to the sites being worked on at any given time. The numbers and types of vehicles, which will be needed for the construction of the proposed development, are known and potential effects are anticipated to be negligible (particularly considering the method of construction over time – refer to Table 3-1). This will need to be confirmed in the EIA Report.

7.1.13 Economic Impacts

According to CoCT (2002), the economic function of the N2 is considered very high as it is one of the major access routes to and from Cape Town via the Strand area. This route is also an important link between Cape Town, the Grabouw/Elgin area and the Overberg wheat lands further afield. On a more local level, this route is used on a daily basis for commuters from Somerset West and Stellenbosch, who live in these towns, but who travel daily into the city to work.

7.2 OPERATIONS-RELATED IMPACTS

The impacts associated with the operation shall include, *inter alia*, noise, health and safety, hazardous substance storage and emergency incidents. In addition, the substation shall require routine maintenance. During this period, activities associated with the substation such as painting and cleaning would increase in occurrence.

7.2.1 Impact on Avifauna

Because of their size and prominence, electrical infrastructures constitute an important interface between wildlife and man. Negative interactions between wildlife and electricity structures take many forms, but two (2) common problems in Southern Africa are electrocution of birds and other animals and birds colliding with power lines (Ledger & Annegarn, 1981; Ledger, 1983; Ledger, 1984; Hobbs & Ledger, 1986a; Hobbs & Ledger, 1986b; Ledger *et al.*, 1992; Kruger & Van Rooyen, 1998; Van Rooyen, 1998; Kruger, 1999; Van Rooyen, 1999; Van Rooyen, 2000, Anderson, 2001; Van Rooyen, 2004). Other problems are electrical faults caused by bird excreta when roosting or breeding on electricity infrastructure (Van Rooyen *et al.*, 2002).

a) Collision with Conductors and Earth Wires

Anderson (2001) summarizes collisions as a source of avian mortality as follows:

"The collision of large terrestrial birds with the wires of utility structures, and especially power lines, has been determined to be one of the most important mortality factors for this group of birds in South Africa (Herholdt 1988; Johnsgard 1991; Allan 1997). It is possible that the populations of two (2) Southern African endemic bird species, the Ludwig's Bustard (*Neotis ludwigii*) and Blue Crane (*Anthropoides paradiseus*), may be in decline because of this single mortality factor (Anderson, 2000; McCann, 2000). The Ludwig's Bustard (Anderson, 2000) and Blue Crane (McCann, 2000) are both listed as "vulnerable" in The Eskom Red Data Book of Birds of South Africa, Lesotho & Swaziland (Barnes, 2000) and it has been suggested that power line collisions is one of the factors which is responsible for these birds' present precarious conservation status.

Collisions with power lines and especially overhead earth-wires have been documented as a source of mortality for a large number of avian species (e.g.

Beaulaurier *et al.*, 1982; Bevanger 1994, 1998). In Southern Africa, this problem has until recently received only limited attention. Several studies however have identified bird collisions with power lines as a potentially important mortality factor (e.g. Brown & Lawson 1989; Longridge 1989). Ledger *et al.*, (1993), Ledger (1994) and Van Rooyen & Ledger (1999) have provided overviews of bird interactions with power lines in South Africa. Bird collisions in this country have been mainly limited to Greater and Lesser Flamingos, various species of water birds (ducks, geese, and waders), Stanley's *Neotis denhami* and Ludwig's Bustards, White Storks (*Ciconia ciconia*), and Wattled (*Grus carunculatus*), Grey Crowned (*Balearica regulorum*) and Blue Cranes (e.g. Jarvis, 1974; Johnson, 1984; Hobbs, 1987; Longridge, 1989; Van Rooyen & Ledger, 1999). Certain groups of birds are more susceptible to collisions, namely the species which are slow fliers and which have limited manoeuvrability (as a result of high wing loading) (Bevanger, 1994). Birds which regularly fly between roosting and feeding grounds, undertake regular migratory or nomadic movements, fly in flocks, or fly during low-light conditions are also vulnerable. Other factors which can influence collision frequency include the following from Anderson (1978) and APLIC (1994):

- the age of the bird (younger birds are less experienced fliers);
- weather factors (decreased visibility, strong winds etc.);
- terrain characteristics and power line placement (power lines that cross the flight paths of birds);
- power line configuration (the larger structures are more hazardous for collisions, with electrocutions the opposite is the case]);
- human activity (which may cause birds to panic and fly into the overhead power lines); and
- familiarity of the birds with the area (therefore nomadic Ludwig's Bustards would be more susceptible).

Although collision mortality rarely affects healthy populations with good reproductive success, collisions can be biologically significant to local populations (Beer & Ogilvie, 1972) and endangered species (Thompson, 1978; Faanes, 1987). The loss of hundreds of Northern Black Korhaans (*Eupodotis afraoides*) due to power line collisions would probably not affect the success of the total population of this species and would probably not be biologically significant, but if one Black Harrier was killed due to a collision, that event could have an effect on the population that would be considered biologically significant. Biological significance is an important factor that should be considered when prioritising mitigation measures. Biological significance is

the effect of collision mortality upon a bird population's ability to sustain or increase its numbers locally and throughout the range of the species."

There is a limited collision threat that will be posed by the proposed power lines. From a biological perspective, the biggest threat will be in the wetland and arable lands (particularly old lands that have reverted to grassland), as those areas could potentially attract any of the remaining power line sensitive Red Data species. Arable lands might attract Lanner Falcon, Peregrine Falcon, Black Harrier and (possibly) Blue Crane and Secretarybird, but the latter two species are likely to be vagrants. There is also a possibility of collisions at wetlands and water bodies, which may potentially affect flamingos, pelicans, Black Stork, African Marsh-Harrier and various non-Red data species.

b) Electrocution of Birds on Pylon Towers

Electrocution refers to the scenario whereby a bird bridges the gap between two (2) phases or a phase and an earthed component thereby causing an electrical short circuit. The larger bird species such as vultures and eagles are particularly vulnerable to this impact, as obviously the larger the wingspan and other dimensions of a bird, the greater the likelihood of it being able to bridge the gap between hardware. Since the proposed power line towers will be higher than the average vegetation, the towers may be the most preferred perching substrate in the area for a number of bird species. However, in this instance, electrocutions are not an envisaged impact because the clearances on 400kV Transmission power lines are too big for any bird to bridge. Electrocutions need therefore not be further investigated.

7.2.2 Impact on Visual Integrity

The following areas have been identified as having potential visual impacts:

- Middle ground views of the vineyards from the Vergenoegd Wine Estate and the Zevenwacht Wine Estate, amongst others.
- Distant vistas of the Helderberg and Hottentots Holland mountains.

Any change in a local view through the introduction of new power line infrastructure in the line-of-sight of a viewer can be considered a visual impact. Visual impacts are subjective and usually considered most significant when the development is dissimilar to other developments in the area, is readily viewed from areas of public

access, such as paths, roads and viewpoints, or is placed in areas which are characterised by significant natural features.

Overhead Transmission power lines are visually intrusive, and cannot be made otherwise. However, the power line envisaged for this proposed development would limit the visual intrusive nature of power lines within the area. Therefore, the visual impact created by the power lines connected to the substation would only be significant in terms of the cumulative effect of positioning power lines adjacent to one another.

7.2.3 Safety Risks

Residents of informal settlements stay beneath power lines as depicted in Figure 7-1, resulting in varying levels of risk. Should a power line snap the potential risk for fire increases.

Figure 7-1: Residents of Khayelitsha living beneath power lines

7.2.4 Socio-economic Impacts

During the operational phase more limited socio-economic impacts are usually associated with a power line and substation. Anticipated impacts include the following:

a) Employment opportunities

- It is not expected that the project will create any long-term job opportunities for locals.

b) Future development

- The eventual servitude alignment may affect proposed future township development and densifications, and *vice versa*. Such developments known at this stage include the following as depicted in Figure 1-1:
  - The proposed Watergate Development located to the west of A.Z. Berman Drive (M36, east of the Woodlands area and south of the R300;
  - The planned Mitchell's Plain District Hospital situated to the east of this Watergate Development near the Lentegeur Hospital and A.Z. Berman Drive in the Lentegeur area. Construction is expected to be completed by the end of 2012.
  - Proposed new houses near Rouxville and Amandelrug. At this stage this should be noted although it is expected that the existing servitude would allow sufficient space for a proposed new 400 kV power line.
  - New mixed-use development, including commercial development and medium-density housing within the Stock Road precinct. Other areas for development include Farm 693 Portion 10 and Erf 3482, with the latter reflecting opportunity for mixed-use development around the Stock Road Station. This area is in close proximity to the proposed Mitchell's Plain Substation Alternative 1, Watergate Development and Mitchell's Plain District Hospital.
  - The proposed Sitari Fields Golf Estate Development alongside the N2 (north of N2) in close proximity to the Firgrove Substation.
- Possible infilling of vacant land in the Hagley, Wimbledon, Happy Valley, Mfuleni and Kalkfontein areas should also be considered during the EIA phase.
- The housing developments within the Driftsands Nature Reserve and surrounding areas should be investigated.
- The residential type of developments stated above should be considered during the EIA phase of the project to determine the least impact servitude corridor. Future infrastructural developments should also be avoided when finalising a Transmission power line route alignment.

c) Visual impacts

- A key impact on the operational phase of a power line is the negative visual impacts associated with these Transmission power lines. Different impacts could be realised based on the characteristics of the receiving environment (e.g. open pristine areas vs. built up areas cluttered with infrastructure, closeness to residential homes, opinions of affected parties etc.).
- A sensitive area in this regard is the Vergenoegd Wine Estate and to a lesser extent the Zevenwacht Wine Estate due to the possible change in visual character of the facilities and subsequent impact on its tourism related activities.
- MCA Urban & Environmental Planners (2002) state that distant vistas of the Helderberg and Hottentots Holland mountains as well as the middle ground views of the vineyards have a high visual quality.

d) Tourism related impacts

- A power line could impact on the tourism potential of facilities attracting large numbers of tourists as it could impact on the visual character and sense of place of the area and facility. A possible negative impact on the Vergenoegd Wine Estate (also due to its historical interest) and in a less significant way on the Zevenwacht Wine Estate is thus possible. The alignment of the proposed power line and its location in relation to these estates and their tourist related activities would be further assessed during the EIA phase of the project.

e) Economic benefits

- Some local, but limited, economic benefits could come about because of the proposed project.

f) Impact of informal settlements on the Driftsands Nature Reserve

- Alternative C traverses the Driftsands Nature Reserve which is a Provincial Nature Reserve managed by Cape Nature. This area is severely affected by unauthorised entry to the Nature Reserve and littering, as well as socio and economic pressure from development and informal settlements situated on its boundary. At this stage it seems as if a power line would not severely impact on the character and *status quo* of the Nature Reserve. In addition, proper maintenance of the servitude could assist in the management of the area and improve the control pertaining to littering in the reserve. Eskom could further

assist Cape Nature to achieve the objective of the Driftsands Nature Reserve, namely to transform the area into a "safe, multi-purpose urban reserve and a treasured community resource"[6].

- The proposed Mitchell's Plain substation Alternative 2 is situated within the boundaries of the Driftsands Nature Reserve. Due to the size of the substation footprint and its visual nature it is anticipated that it would have an impact on the character of the Nature Reserve and possibly on future developments within the Nature Reserve, as well as the overall development and protection of the Nature Reserve.
- Care should thus be taken so that the proposed Transmission power line and substation does not negatively impact on the existing traditional Xhosa initiation site situated within the reserve, as well as on the plans to develop the reserve as a multi-purpose urban reserve[7].

g) Intrusions during maintenance activities

- Maintenance of the power line could result in intermittent intrusion impacts on private properties.

h) Resettlement

- The establishment of the proposed power line servitude could result in the resettlement of individuals because of the densely populated settlement patterns found in the study area. Moreover, encroachment into the servitude areas is already an existing problem throughout the study area, especially in the more informal settlements found in the Khayelitsha area.
- With regards to resettlement, the following cumulative issues or possible impacts should also be noted at this stage:
    - Resettlement is a lengthy process associated with various levels of conflict arising between residents due to the perceived benefits that could accrue to those being resettled. Most groups in a settlement usually struggle to obtain as much benefit from the process as possible.
    - The socio-economic status of the different residents (e.g. poor households / possible children headed households as a result of the impact of HIV/Aids) in the affected area could worsen the intricacy of the process.

[6] http://www.openafrica.org

[7] http://www.openafrica.org

- Political influences could exacerbate the complexity of the process.
- Settling of individuals and/or jobseekers from outside the study area could occur as these individuals could aim to take advantage of the relocation process by posing as residents that should be resettled.
- Suitable land for the resettlement of individuals is usually not readily available. It is assumed that if appropriate serviced land would have been vacant, a process would have been initiated to relocate those residents of Khayelitsha and Mitchell's Plain who are currently staying in extremely underprivileged living conditions. This would be further investigated during the EIA process. However, resolving the relocation process is not an environmental requirement and as such is undertaken exclusively from the EIA process.

- Resettlement is a complex and lengthy process and alternatives should rather be found before resettling any individuals. Based on the above challenges that could arise, it is thus recommended that the project should rather steer clear of alternatives that would require the resettlement of any individuals. It must be noted that the resettlement of informal settlements poses different risks and potential issues as opposed to the resettlement of formal settlements. However, this issue would be further assessed during the EIA phase.
- At this stage of the study, it should be emphasised again that the preferred route alignment should limit the areas where individuals would require relocation due to the proposed Transmission power line.

i) <u>Impact on farming activities</u>

- The proposed Transmission power line (tower footprint) could impact on small scale farming activities such as vegetable fields or urban farming in the study area.
- A power line could negatively impact on the Vergenoegd Wine Estate's wine farming activities. At this stage it is perceived that the proposed power line would have a lesser impact on these activities if it is possible to avoid the estate's main activities on the western side of the Eerste River.

j) Impact of noise

- During operation, it is possible that noise will be produced by the Transmission power line (called corona[8]). Although audible, this noise is usually within acceptable noise limits.

7.2.5 Economic Impacts

Based on CoCT (2002), the land value along the N2 will be taken into account during the EIA Phase as this is anticipated as an issue of concern.

7.3 POTENTIAL SOCIAL CONFLICT

Areas of concern with regards to social issues in the study area have been identified based on the various route alignments, as follows:

- Alternative A:
  - Future Mitchell's Plain District Hospital situated east of A.Z. Berman Drive, south of the R300 and north of Lentegeur and the Lentegeur Hospital.
  - Bongani (informal settlement of Khayelitsha) situated to the south of the railway line and Lansdowne Road (M9), as well as the area just to the north of Lansdowne Road (M9) and west of Mew Way (M44) and south of the N2.
  - The Vergenoegd Wine Estate situated to the north of the N2, east of Baden Powell Drive (R310) and south of Eersterivier Suid.
  - The proposed Sitari Fields Golf Estate Development alongside the N2 (north of N2) in close proximity to the Firgrove Substation.
- Alternative B:
  - No 'hot spots' have been identified with this alternative at this stage.
- Alternative C:
  - The Stikland Industrial area especially in the vicinity where the proposed power line crosses the R300 in close proximity to Timbacare, the Belville Pistol Club and the golf driving range.
  - An area near the Belville South Landfill site where the crossing of existing lines and placement next to the R300 and Oakdene and Kalkfontein areas (informal settlements) are problematic.

[8] Corona can be caused by water droplets forming on a conductor and causing the breakdown of air molecules (hears as a crackling sound). There are no health risks associated with corona.

- The proximity of existing Transmission and Distribution power lines within the area near the Kuilsrivier Water Care Works situated to the east of the Kuils River highway (R300) and to the north of Stellenbosch Road (M12).
- Delft South located to the south of the Cape Town International Airport, west of the R300 and to the north of the N2 and Khayelitsha.

- Alternative D:
  - Proposed new residential development to the east of Amandelrug and Rouxville, south of Bottelary Road.
  - Possible spacing problems near the Zewenwacht shopping mall area and Saxenburg Industrial Park located near the corner of Van Riebeeck Road (R102) and Stellenbosch Road (M12).
  - Extensions of the Mfuleni area to the north. The Mfuleni area is located to the north of the Swartklip-Old Faure Road and directly east of the Driftsands Nature Reserve.
  - Bongani (informal settlement of Khayelitsha) situated to the south of the railway line as well as the area north of Lansdowne Road (M9) and west of Mew Way (M44) and south of N2. This is where Alternative C and D join.

7.4 POTENTIAL CUMULATIVE IMPACTS

The potential cumulative impacts related to both the Firgrove-Mitchell's Plain project as well as the Mitchell's Plain-Philippi project will be investigated as part of the EIA Phase. Even though these projects operate independent of each other, there are common elements between both projects.

8. ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

8.1 STUDY APPROACH

The EIA process is a planning and decision making tool that identifies the potential negative and positive impacts of a proposed development. It also recommends ways to enhance the positive impacts and to minimize the negative ones. The environmental studies that will be undertaken will address the impacts associated with the proposed development, and provide an assessment in terms of the biophysical, social, cultural-historic and economic environments. This will assist both DEA and Eskom in making decisions regarding implementation of the proposed development. The environmental assessment will be undertaken in compliance with the NEMA, specifically EIA Regulations GNR Nos. 385, 386 and 387 of 21 April 2006. Cognisance will also be taken of related guideline documents and other relevant legislation.

The EIA process will consist of three phases namely, the scoping phase; the impact assessment phase and the decision-making phase.

8.2 SCOPING PHASE

The aim of the scoping phase of the project is to identify and define the issues that need to be addressed in the impact assessment phase.

During the PPP, the interested and affected parties (I&APs) are identified and are given the opportunity to identify issues and concerns that are related to the study area. A first round of public participation has been undertaken as documented in Section 8.3 below.

The Draft Scoping Report will be made available to I&APs for review and the Final Scoping Report will incorporate all comments that have been received and then submitted to the DEA for consideration.

8.3 PUBLIC PARTICIPATION PROCESS IN THE SCOPING PHASE

The Public Participation Process (PPP) is an integral requirement of the NEMA. Under the supervision and guidance of the DEA, BKS has conducted a PPP for the

proposed development, as prescribed by Section 56 of the EIA Regulations (2006). This is due to the scale, nature and affected footprint of the proposed project.

8.3.1 Objectives and General Approach

The chief objectives of the PPP are to:

- inform identified I&APs of and provide sufficient background and technical information regarding the proposed development;
- create networks and feedback mechanisms whereby I&APs could participate and raise their viewpoints (issues, comments and concerns) with regard to the proposed development; and
- assist in identifying potential environmental (biophysical, cultural-historic, social and economic) impacts using on-the-ground information through I&APs available experience.

The PPP would thus ensure that the views of the I&APs would be reflected and considered by the applicant.

The approach towards any PPP is dependent upon the details of the project, as each project has a particular geographic and technical nature and hence the PPP should be structured accordingly. Where possible and within the required statutory frameworks, it is also desirable to structure such a process to address the needs of I&APs.

All I&APs are given equal opportunity to comment and raise any issue relating to the impact of the proposed development on the biophysical, social and economic environment.

8.3.2 Identification and Registration of I&APs on a Database

Under the guidance and supervision from the DEA, the following key stakeholders were identified for engagement on any issues that may transpire during the EIA process for the proposed development:

- Registered I&APs;
- Western Cape Department of Environmental Affairs and Development Planning (DEADP);

- City of Cape Town Metropolitan Municipality (CoCT);
- National Department of Water Affairs (DWA);
- South African Heritage Resources Agency (SAHRA);
- Heritage Western Cape;
- Cape Nature; and
- Earthlife Africa.

A database has been compiled and will be updated throughout the EIA process, should additional stakeholders be identified.

8.3.3 Project Announcement Phase

Phase 1 of the PPP entailed the announcement of the project to the identified key stakeholders during the designated timeframe. The project announcement phase for the original study area was from 22 April 2010 to 27 May 2010. Consultation with I&APs and relevant stakeholders were undertaken according to the following methods (refer to Appendix B for further details):

- Advertisements were placed in the following newspapers:
  - Die Burger (Provincial);
  - Cape Times (Provincial);
  - The People's Post (Local);
  - The Plainsman Newspaper (Local); and
  - The Vukani (Local).
- A Background Information Document (BID) was circulated to I&APs and stakeholders that registered and were identified for registration.
- Site notices were placed at 35 strategic locations (refer to Appendix B) along the study area.
- Flyers were distributed in the study area.
- Public open days were scheduled as per Table 8-1.

Table 8-1: Public Open Days in Scoping Phase for original study area

Affected Suburb	Date	Time	Venue
Mitchell's Plain & Philippi	Thursday, 6 May 2010	10:00 to 14:00	Manenberg Community Centre 2 Swakop Road, Manenberg
Firgrove & Macassar	Friday, 7 May 2010	11:00 to 18:00	Firgrove Primary School 7th Street, Firgrove
Khayelitsha Township	Saturday, 8 May 2010	09:00 to 13:00	Matthew Goniwe High School Nyathi Street, Site B, Khayelitsha

The expansion of the study area resulted in the repeat of the project announcement phase, but it was limited to the expanded study area. Therefore, the revised timeframe to announce the project to the I&APs of the expanded study area was from 26 August 2010 to 8 September 2010. Similar to the methodology stated above, the following methods were undertaken (refer to Appendix B for further details):

- Advertisements were placed in the following newspapers:
  - Die Burger (Provincial);
  - Cape Times (Provincial);
  - The Daily Sun (Local); and
  - Die Son (Local).
- The BID was revised and circulated to I&APs and stakeholders that registered and were identified for registration.
- Site notices were placed at 13 strategic locations (refer to Appendix B) along the study area.
- Flyers were distributed in the study area.
- Public open days were scheduled as per Table 8-2.

Table 8-2: Public Open Days in Scoping Phase for expanded study area

Affected Suburb	Date	Time	Venue
Kuils River	Monday, 6 September 2010	09:00 to 12:00	Kuils River Public Library
Khayelitsha	Monday, 6 September 2010	15:00 to 18:00	Oliver Tambo Sports Centre
Delft	Tuesday, 7 September 2010	09:00 to 12:00	Delft Public Library
Silversands	Tuesday, 7 September 2010	14:00 to 17:00	Silversands Secondary School

8.3.4 Draft Scoping Report Review

The purpose of this DSR is to enable the registered I&APs to verify that their contributions have been captured, understood and correctly interpreted. The DSR is available for review by registered I&APs from 30 September 2010 to 10 November 2010. Advertisements will be placed in the local and regional/national newspaper to announce the availability of the DSR for review. Should I&APs wish to register during this period, they would be allowed to. However, only the comments and issues raised up to 10 November 2010 will be incorporated in the Final Scoping Report, for submission to the DEA. Comments and issues raised subsequent to the end date will be taken into consideration during the EIA Phase.

I&APs can comment on the DSR in various ways, such as completing the comment sheet, submitting individual comments in writing, by facsimile or by e-mail and through one-on-one discussions with members of the EIA team during meetings.

8.4 ENVIRONMENTAL IMPACT ASSESSMENT PHASE

The EIA for the proposed project is being conducted in accordance to the process as described in Sections 27 to 36 of the EIA Regulations (2006) promulgated in terms of section 24(5) of the NEMA. BKS is responsible for the process and collation of information from the specialist reports including the issues raised from the PPP.

8.5 SERVITUDE NEGOTIATION PROCESS

The public participation process undertaken for the EIA does not include the final servitude negotiations with the landowners that will be directly affected by the final route. It is important that the aims of the EIA and servitude negotiation processes are seen as separate. They share a common cause (the construction and operation of a Transmission power line) and may share common landowner databases, but they have different aims. The servitude negotiations task will be undertaken by a negotiator from Eskom if a positive environmental authorisation for the project has been received. The Eskom negotiator has, however, been involved in the project team site visit and discussions regarding the selection of a recommended corridor for the proposed line. Therefore, while an extensive effort was made to identify and involve all possibly affected landowners through representative organisations such as the municipalities and farmers' organisations and as far as possible, with individual

landowners, the PPP was not able to consult individually with all the potentially affected landowners during the EIA study.

SERVITUDE NEGOTIATION AND THE EIA PROCESS

Transmission power lines are constructed and operated within a servitude (up to 80m wide for 400kV lines) that is established along its entire length. The servitude allows Eskom Transmission certain rights and controls that support the safe and effective operation of the line. The process of achieving the servitude agreement is referred to as the Servitude Negotiation Process, or just the negotiation process. The negotiation process is undertaken directly by Eskom Transmission. Important points relating to the EIA process are as follows:

- Servitude negotiation is a private matter between Eskom Transmission and the landowner concerned.
- The negotiation process involves a number of stages (see text box below), and culminates in the 'signing' of a servitude. Here Eskom Transmission enters into a legal agreement with the landowner.
- The agreements will detail such aspects as the exact location and extent of the servitude, and access arrangements and maintenance responsibilities.
- Compensation measures are agreed in each case.
- It may take place at any time in the planning of a new line.
- It must be completed (i.e. the agreement must be signed) before construction starts on that property.
- It is independent of the EIA process.

The EIA process has become important in the initial planning and route selection of a new Transmission power line. For this reason, it would normally be preferable that the negotiation process begins after the EIA has been completed. At this stage there is greater confidence in the route alignment to be adopted, and it would be supported by an environmental authorisation.

However, it may be required that the negotiation process needs to start earlier, and may begin before or run in parallel to the EIA process. This may be due to tight timeframes, knowledge of local conditions and constraints, etc. Eskom Transmission has a right to engage with any landowner at any time, though they do so at risk if environmental authorisation has not been awarded.

Source: Eskom Transmission, Gamma-Omega 765kV Transmission Line, Draft Environmental Impact Report, Main Report, March 2002

THE NEGOTIATION PROCESS

The negotiation process can be extensive, often running into years on the longer lines. It is therefore critical that it is correctly programmed into the planning of a new line. The negotiation process involves:

- Initial meeting with the landowner.
- The signing of an 'option' to secure a servitude (this indicates that the owner will accept that the line will cross his property, subject to conditions to be finalised in the negotiation of the servitude agreement). An option is valid for one year.
- Once the route is confirmed (i.e. options signed with the upstream and downstream landowners) the servitude agreement will be finalised with the individual landowners. This agreement will set out the conditions for the establishment and operation of the servitude, and will be site specific (different landowners may have different requirements). Compensation payments are made when the servitude is registered at the Deeds office.
- Once the construction is complete and the land rehabilitated to the landowners satisfaction, the landowner signs a 'Final Release' certificate. Until such time Eskom Transmission remains liable for the condition of the land.
- Once the clearance certificate is signed, the responsibility for the line and servitude is handed over to the regional Eskom Transmission office. Prior to this the Eskom national office is responsible for the process.

Source: Eskom Transmission, Gamma-Omega 765kV Transmission Line, Draft Environmental Impact Report, Main Report, March 2002

8.6 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations have been identified for this scoping process:

- The EIA process is multi-disciplinary, which was informed by the project team (Table 2-1). It is therefore necessary to assume that the information provided by the project team is accurate and true.
- In order to obtain a comprehensive understanding of the dynamic of the flora, fauna, avifauna and the wetland environment on the study site, the ecological

investigation and the wetland delineation studies should consider investigations across different seasons and through replication. This would allow a true reflection of baseline investigations. However, due to time constraints, such long-term studies are not feasible with the EIA process.

- Limited time is available for the study and the field survey was limited to a snapshot view of all areas of concern.
- The assumption was made that the above sources of information are adequately reliable. However, there are factors that may potentially detract from the accuracy of the predicted results. The SABAP data covers the period 1986-1997. Bird distribution patterns fluctuate continuously according to availability of food and nesting substrate. Fortunately, the new SABAP2 project has so far gathered some data for these QDGCs (83 checklists for 3418BA and 244 for SABAP2) therefore the SABAP data could be supplemented with this more recent dataset, supplemented by general knowledge of the area.
- It is difficult to make comparisons between the two SABAP datasets as far as reporting rates of species are concerned, because of different efforts that went into the data capturing e.g. for 3418BA there were 684 SABAP but only 83 SABAP2 checklists completed (for a full discussion of potential inaccuracies in SABAP data, see Harrison *et al.*, 1997).
- Predictions in this study are based on experience of these and similar species in different parts of South Africa. Bird behaviour can never be entirely reduced to formulas that will hold true under all circumstances. However, power line and substation impacts can be predicted with a fair amount of certainty, based on experience gained by the avifauna specialist through the investigation of hundreds of localities in southern Africa, since 1996, where birds have interacted electrical infrastructure.

9. PLAN OF STUDY FOR EIA

9.1 INTRODUCTION TO EIA PHASE

A Plan of Study for the EIA has been prepared according to the process as described in Sections 27 to 36 of the EIA Regulations (2006) promulgated in terms of Section 24(5) of the NEMA, to provide the DEA with adequate information in order to obtain authorisation, and proceed with the proposed activity.

The Plan of Study for EIA includes a description of the environmental issues that have been identified during the Scoping phase and which will require further investigation and assessment.

9.2 SPECIALIST STUDIES

The EIA Phase will include the following specialist studies:

- Geotechnical Investigation;
- Soil and Agricultural Potential Assessment;
- Agricultural Economic Potential Assessment;
- Ecological Assessment (including flora and fauna);
- Wetland Assessment;
- Avifauna (Birds) Assessment;
- Heritage/Archaeological Impact Assessment;
- Social Impact Assessment;
- Visual Impact Assessment;
- Economic Assessment (based on CoCT, 2002, discussed in Section 7.1.13; and
- Legal Review.

Specialist studies will be undertaken in compliance with Section 33(2) of GNR No. 385, which include the following, *inter alia*:

(a) details of –
    (i) the person who prepared the report; and

(ii) the expertise of that person to carry out the specialist study or specialised process;

(b) a declaration that the person is independent;

(c) an indication of the scope of, and the purpose for which, the report was prepared;

(d) a description of the methodology adopted in preparing the report or carrying out the specialised process;

(e) a description of any assumptions made and any uncertainties or gaps in knowledge;

(f) a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives, on the environment;

(g) recommendations in respect of any mitigation measures that should be considered by the applicant and the competent authority;

(h) a description of any consultation process that was undertaken during the course of carrying out the study;

(i) a summary and copies of any comments that were received during any consultation process; and

(j) any other information requested by the competent authority.

9.2.1 Terms of Reference for the Geotechnical Investigation

The Geotechnical Investigation will be investigated on a desktop level, mapped on GIS and integrated with the other specialist studies. This study will inform the preferred and alternative route alignments of the Transmission power lines, as well as the preferred and alternative locations of the proposed Mitchell's Plain Substation.

The purpose of the investigation will be to provide technical advice on the following:

- The expected bedrock geology and soil cover within the study area based on the data available;
- Recommendations regarding the foundation trench stability, founding masts and poles, and seismicity; and
- Information regarding excavation potential together with the presence of active soil layers and any slope stability problems.

9.2.2 Terms of Reference for the Ecological Assessment

The ecologist will produce an ecological sensitivity map of the study area, indicating areas of low, medium and high ecological sensitivity. Attempts will be made to avoid

areas of medium and high ecological sensitivity. However, if this cannot be avoided completely, mitigation measures will be proposed

9.2.3 Terms of Reference for the Wetland Assessment

The Wetland Assessment will be undertaken by Betsie le Roux of BKS, with the purpose of determining the impact of the proposed project on the wetlands identified. The sensitivity of the wetlands identified will be assessed as part of the EIA Phase.

9.2.4 Terms of Reference for the Avifauna Assessment

An avifauna (birds) assessment will be undertaken by Chris van Rooyen of Chris van Rooyen Consulting. The following issues will be addressed as part of the EIA Phase:

- The alternative alignments will be investigated and assessed from a potential bird impact perspective to arrive at a preferred alignment.
- Potential impacts will be discussed in more detail.
- Mitigation measures will be suggested if and where appropriate.

9.2.5 Terms of Reference for the Heritage Impact Assessment

The Heritage Impact Assessment (HIA) report will contain the following:

- Legislation pertaining to Heritage Management, explained and break down given of important points;
- The identification and mapping of all heritage resources in the affected area;
- An assessment of the significance of such resources in terms of the heritage assessment criteria;
- An assessment of the impact of the development of such heritage resources;
- If heritage resources will be adversely affected by the proposed development, consideration of the alternatives; and
- Plans for mitigation of any adverse effects during and after the completion of the proposed development.

9.2.6 Terms of Reference for the Social Impact Assessment

The SIA Process will serve to identify the anticipated positive and negative impacts that the proposed development could have on the social environment. Issues that

have to be addressed during future processes and studies will also be highlighted. This will enable the Applicant and community to jointly deal with possible changes in a proactive and participative manner, and to determine which aspects need to be mitigated. The study also serves to identify the potential for social mobilisation against the project, identify social impacts that cannot be resolved and variables that will need to be addressed by avoidance or mitigation. The SIA report will deal with preliminary impacts associated with the construction and operational phases of the proposed project and how it could affect the day-to-day life of notably the communities living in Mitchell's Plain, Khayelitsha, Firgrove and Macassar.

The rating of social impacts will be based on the criteria contained in the EIA Regulations (2006) in terms of the NEMA. The social impacts will be assessed against the background of the following impact variables:

- **Population impacts**, including population change and inflow or outflow of temporary workers (construction/decommissioning related impact).
- **Community/institutional arrangements**, including attitude formation, interest group activity, alteration in size and structure of local government, enhanced economic inequities and change in employment equity.
- **Individual and family level impacts**, including disruption in daily living and movement patterns, disruption in social networks and change in leisure opportunities.
- Perceptions and impact regarding **public health, safety and security**.
- **Community infrastructure needs**, including change in community infrastructure, land acquisition and disposal, and effects on known cultural, historical and archaeological resources.
- **Intrusion impacts**, including air pollution, noise pollution and light pollution.

A comprehensive literature review and analysis will be undertaken during the EIA phase. This would lead to further demographic and socio-economic information about the receiving environment and to build on the initial profiling of the local population's socio-economic characteristics. During the EIA phase, more primary data would also be gathered through consultation with the I&APs, and linkages with the PPP.

The SIA team will study and analyse the information gathered by the biophysical studies. This information would include technical, environmental, economic and demographic aspects, land-use changes, impact on other facilities, services etc. The

SIA will be done in parallel with the PPP, which would help the project team to assess the impact of the proposed development on the direct (surrounding communities) and indirect (regional) environment.

9.2.7 Terms of Reference for the Visual Impact Assessment

The primary objective of this specialist study is to identify the potential impact of the proposed development on the character and sense of place of the area. This visual Impact Assessment will have the following objectives:

- Describe the visual character of the site by evaluating components such as topography and current land use activities. This will record the *status quo* of the visual environment.
- Identify elements of particular visual quality that could be affected by the proposed project.
- Describe and evaluate the visual impacts of the individual components of the proposed project from identified critical areas and view fields. This assessment should assess impacts according to the criteria and terminology.
- Recommend mitigation measures to reduce the potential visual impacts generated by the components of the proposed project for inclusion into the EMP.
- Determine the extent of the visibility of the project from surrounding areas.
- Propose relevant aspects to be included in a visual monitoring programme.

9.2.8 Enviro-Legal Review

The environmental legal input that will be provided, will largely involve review responsibilities and advice on process issues. This is a particularly important part of the EIA Report due to the rapidly changing legislative context. BKS will ensure that the EIA process is fully compliant with the legal requirements and it will be essential that proper advice is provided in this regard.

The following specific input will be provided:

- Review of the Draft Scoping Report and the EIA Report (including the Draft EMP) with brief written comments on the legal process.
- *Ad hoc* telephonic/e-mail input to project team queries, including legal issues emerging from the public participation process.

- A review of the environmental legal requirements that is applicable to the proposed activity itself.

9.3 ADDITIONAL ISSUES FOR ASSESSMENT

Based on the issues identified in Section 7, the EIA Phase will entail the assessment of these issues. Input into the EIA Phase will be provided by the various specialists as described in Section 9.2. However, the following additional issues will also be assessed, as described previously:

- Impacts on the traffic during the construction phase as a result of the movement of construction vehicles.
- Impact on the potential nuisances such as air quality and noise within the study area.

9.4 EIA REPORT

Once the specialist investigations have been completed and the findings and recommendations integrated by the team, an EIA Report will be compiled according to Government Notice R385, Section 32 (2) and will include the following:

- A description of the EAP who prepared the report;
- An updated detailed description of the proposed activity;
- An updated description of the environment that may be affected;
- A description of the PPP that was undertaken during the EIA Phase;
- An updated description of the need and desirability of the project and details of the alternatives that were investigated;
- Findings and recommendations of specialist studies and EAP;
- An indication of the method used to identify significance;
- A comparative assessment of all alternatives (including the do-nothing alternative);
- An assessment of each potentially significant impact;
- An opinion of whether the activity should be authorised or not, and if it should be authorised, and conditions that should be made in respect of the authorisation;
- An Environmental Impact Statement; and

- A draft Environmental Management Plan for construction, operation and maintenance of the proposed activity.

9.5 IMPACT ASSESSMENT METHODOLOGY

9.5.1 Impact Assessment

The criteria used for the assessment of the potential impacts of the proposed development are described in Table 9-1. In addition, cumulative impacts will be included as part of the impact assessment process.

Table 9-1: Impact Assessment Criteria

Criteria	Description
Nature	Includes a description of what causes the effect, what will be affected and how it will be affected.
Extent	The physical and spatial scale of the impact.
Duration	The lifetime of the impact is measured in relation to the lifetime of the proposed development.
Intensity	Examining whether the impact is destructive or benign, whether it destroys the impacted environment, alters its functioning, or slightly alters the environment itself.
Probability	This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the lifecycle of the activity, and not at any given time.
Status	Description of the impact as positive, negative or neutral.
Significance	A synthesis of the characteristics described above and assessed as low, medium or high. A distinction will be made for the significance rating without the implementation of mitigation measures and with the implementation of mitigation measures. The significance is determined with the following equation: **Significance = (Extent + Duration + Intensity) × Probability**

9.5.2 Identification of Mitigation Measures

The mitigation measures describe possible actions for the mitigation of the significant negative environmental impacts identified in the assessment. The philosophy of identifying mitigation measures for negative impacts are based on the reduction of the impact at source, the management of the impact through monitoring and control, and the involvement of the I&APs in consideration of mitigating measures, where appropriate.

9.5.3 Cumulative Impacts

The possible cumulative impacts will also be considered. A cumulative impact, in relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

9.5.4 Maximisation of Positive Impacts

The philosophy that is followed focuses on maximizing the benefits to the local environment, the local and regional communities as well as the potential enhancement of rehabilitation measures.

9.6 ENVIRONMENTAL MANAGEMENT PLAN

A site-specific EMP will be included as part of the EIA Report. The study area will require that a thorough management plan is prepared, with a focus on the issues identified during the EIA process. The EMP will outline the impacts and mitigation measures for the construction phase of the project. The EMP will comprise the following:

- Summary of Impacts: The predicted negative environmental impacts for which mitigation is required are summarised. Positive impacts requiring enhancement will also be listed.
- Description of mitigation measures: The EMP identifies feasible and cost effective mitigation measures to reduce significant negative environmental impacts to acceptable and legal levels. Mitigation measures are described in detail and accompanied by designs, equipment descriptions, and operating procedures, where appropriate. The technical aspects of implementing the mitigation measures are also described.
- Description of a monitoring programme: Environmental performance monitoring was designed to ensure that mitigation measures are implemented. The monitoring programme clearly indicates the linkages between impacts, indicators to be measured, measurement methods and definition of thresholds that will signal the need for corrective actions.
- The Emergency Action Plan: The identification of possible accidents during construction and operational phases of the project with measures on how these will be prevented and/or managed.

- The incorporation of the Eskom's Environmental Guidelines for bush clearing.
- The institutional arrangements depict and define the responsibilities for mitigation and monitoring actions.
- Legal enforceability: The key legal considerations with respect to the EMP are:
  - Legal framework for environmental protection; and
  - Legal basis for mitigation.
- The Implementation schedule and reporting procedures that specify the timing, frequency, and duration of the mitigation measures.
- A description of requirements for record keeping, reporting, review, auditing and updating of the EMP will be provided.

9.7 PUBLIC PARTICIPATION IN THE EIA PHASE

The objective of the PPP in the EIA phase of the project is to present the findings of the investigations to the stakeholders and to provide them with an opportunity to comment on these. In order to achieve this, the following consultation process will be undertaken, similar to the Scoping Phase:

- The draft EIA Report will be available for review by registered I&APs for a period of 40 days (determined under the guidance of the DEA).
- Public meetings will be held at various locations within the study area in order to present the findings of the EIA Report to I&APs.

All the registered I&APs on the I&AP database will be notified in writing (e-mail/post/fax) of the abovementioned consultation process.

Comments and issues raised will be noted in an updated version of the Issues and Responses Report (Appendix B). These comments will then be considered and incorporated into the Final EIA Report for submission to the DEA.

9.8 EIA PHASE PROGRAMME

The key dates for the proposed development are listed in Table 9-2.

Table 9-2: Key Dates in the EIA Phase

Date	Activity
25 January 2011 – 7 March 2011	PPP Phase 3: Public Review of Draft EIA Report and EMP
21 February 2011 – 28 February 2011	Anticipated dates of public meetings
11 March 2011	Submission of Final EIA Report to the DEA
14 March 2011 – 20 June 2011	Authority Review of EIA Report
21 June 2011	Environmental Authorisation Issued

10. CONCLUSIONS AND RECOMMENDATIONS

The key issues identified during the Scoping Phase for the construction and operational phases of the project are as follows:

- Potential Social Impacts:
  - Safety-related impacts.
  - Waste-related impacts.
  - Social impacts.
  - Impact on traffic.
  - Impact on heritage resources.
  - Impact on visual integrity.
  - Potential nuisances.
- Potential Biophysical Impacts:
  - Geotechnical Impacts.
  - Impact on soil and agriculture.
  - Impact on ecology.
  - Impact on wetlands.
  - Impact on avifauna.
- Potential Economic Impacts:
  - Impact on economic value of agricultural lands.

The EAP is of the opinion that Eskom Holdings Limited has followed due environmental process during the undertaking of this scoping process and associated PPP. The identification of key issues during the scoping process has not shown any negative impacts that may be considered as fatal flaws. However, a number of potentially significant issues have been highlighted for further investigation in order to assess their significance, and to determine the need for the implementation of mitigation measures in order for the overall project to be environmentally sustainable.

Following the review period of the DSR, the issues raised by I&APs and regulatory authorities will be highlighted in yellow and presented in a Final Scoping Report, which will be submitted to the competent approving authority, the DEA, for consideration and acceptance. Following which, the EIA Phase will commence.

It is, therefore, recommended that the DEA accept the Scoping Report and issue permission to undertake the EIA Phase of the EIA process as outlined in the Plan of Study for EIA.

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12. GLOSSARY OF TECHNICAL TERMS

Conductor: A wire, cable, or other body that is capable of carrying electric current.

Feeder Bay: The area where a power line is connected to the substation.

Kilovolt: A unit of potential differences equal to 1000 volts.

No-go area: An area in which the Transmission power line cannot be routed due to resulting significant environmental, technical and social impacts.

Pylon: a large vertical steel tower-like structure supporting high-tension electrical cables.

Route: The exact servitude in which the Transmission power line could be built.

Servitude Right: A real right in favour of the servitude holder allowing the erection and maintenance of structures and cables to transmit electricity over portions of land and restricting any activities that could pose a hazard to the transmission of electricity, the environment and/or the safety of human and other living beings.

Study area: The area that will be covered by the EIA process within which possible location alternatives will be investigated.

Substation: A collection of equipment for the purpose of raising, lowering and regulating the voltage of electricity.