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TYPE OF DOCUMENT: DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT FOR THE PROPOSED FIRGROVE MTS SUBSTATION UPGRADE AND PALMIET STIKLAND LOOP IN LOOP OUT

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List of Abbreviations

BID	Background Information Document
CBOs	Community Based Organizations
DEA&T (DEAT)	Department of Environmental Affairs and Tourism
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMP	Environmental Management Plan
EMS	Environmental Management System
I & APs	Interested and Affected Parties
IEM	Integrated Environmental Management
PPP	Public Participation Process
ECO	Environmental Control Officer
PPP	Public Participation Process
DEA	Department of Environmental Affairs

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Contact Details

Table 1: Contact details of EAP

Name of an EAP	Mr. Calvin Mawelela
Qualification of an EAP	B-Tech Environmental Science
Name of Company:	Enkanyini Projects
Physical Address:	29 Bradley Street, The Reeds,0157
Postal Address:	P.O Box 4983, The Reeds, 0158
Telephone number	(012) 657 1505
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Table 2: Contact details of applicant

Name of applicant:	Eskom Holdings Limited
Contact Person:	Mr. K Makhanya
Physical Address:	1 Maxwell Drive, Sunninghill, Johannesburg 2157
Postal Address:	P O Box 1091, Johannesburg, 2001
Telephone number:	(011) 800 2706
Fax Number:	(011) 800 3917

Table 3: Particulars of proposed development site

Magisterial district:	Cape Town Metropolitan
Current use of surrounding areas:	Wine farms, residential, railway line and wetland
Property 1	**Farm 664 remainder of portion 7 of farm Zandvliet**
Land Owner:	Weening Berg Winery Pty Ltd (Mr. Ken Nicholson)
Contacts of the Land owner :	021 842 2255
Property 4	**Farm 664 portion 70 of farm Zandvleit**
Land owner:	Suid-Afrikaanse Spoorpendelkorporasie LTD (Mr Vicent Matabane)
Contacts of the Land owner:	011 584 0551
Property 3	**Farm 664 portion 93 of farm Zandvleit**
Land owner:	Eskom Distribution Western Cape (Mr. Edgar-John Kleinveld)
Contacts of the Land owner:	021 980 3058
Property 5	**Farm 664 portion 114 of farm Zandvleit (Current positioning of the substation)**
Land owner:	Eskom Distribution Western Cape (Mr. Edgar-John Kleinveld)
Contacts of the Land owner:	021 980 3058
Land owner: 2	**Farm 1101, remainder extent of farm Zandvleit**
Land owner :	Rusehof Boerdery Pty Ltd (Mr. Anton Bredell)
Contacts of the Land owner:	021 842 2193

1. Introduction

1.1 Introduction

Enkanyini Projects has been appointed by Eskom Holdings Limited to conduct an Environmental Impact Assessment for the proposed Firgrove MTS substation upgrade and Palmiet/Stikland loop in loop out.

2. Enkanyini Projects background

2.1. Enkanyini Projects Expertise

Enkanyini Projects is a holly owned black company providing Consultancy in Environmental, Social and Projects Management services. The company has varies expertise in the environmental field, with number of successful environmental friendly project completed. Enkanyini Projects was formally formed in 2005 in an effort to make a meaningful and sustainable contribution to the development and improvement of the quality of environment for the people of South Africa. Enkanyini Projects has worked and continues to work in partnership with other establishment Environmental Consultants in an endeavor to build its expertise while ensuring the best service to its Clients.

2.2 Staff.

Our staff has been carefully selected to meet the specific requirements of our various business activities. Since inception we have always realized that our staff are and will always be our most valuable assets. Our highly experienced diverse team covers the full spectrum of environmental and social consulting service, environmental project management. Through their commitment, dedication and in depth understanding of our client's needs the company is now ready to become one of South Africa's, support and solution providers.

3. Description of the project activities

The scope of work comprises of provision of all supervision, constructional and all other requirements to execute the proposed construction activities. The proposed upgrading of Firgrove MTS will cover the area of about 400m X 300m.

The following activities will be undertaken during the upgrading of Firgrove MTS substation and Palmiet/Stikland loop-in loop-out;

a. Create a substation with footprint to accommodate 4x500MVA 400/132kV transformers at Firgrove (Firgrove MTS)

- Find the site for the MTS next to the existing 132kV Firgrove Distribution substation
- Establish the Firgrove MTS as Follows
    - Install 400kV double busbar 9x400kV bays
    - Install 2x500MVA 400/132kV Transformers(as phase 1)
    - Extend the existing 132kV busbar to accommodate the new 2 transformers and allow connection to the existing distribution busbar

b. Loop-in loop-out of the existing Palmiet-Stikland 400kV line:

- Establish a servitude for approximately 200m of 400kV double circuit line
- Cut the existing Palmiet-Stikland line at approximately 20km
- build approximately 200m of 1x400kV line on a double circuit tower to establish:
    - 1x400kV Firgrove - Stikland line (approximately 31km)
    - 1x400kV Firgrove - Palmiet line (approximately 21 km)

4. Description of the property

The Figrove MTS substation is situated in the farm Zandvleit 664 portion 114 along the road R102 Van Riebeck next to Macassar area in Western Cape.

***Table 1*: GPS Coordinates**

34º04'90"	18º78'21"

Firgrove MTS substation locality map

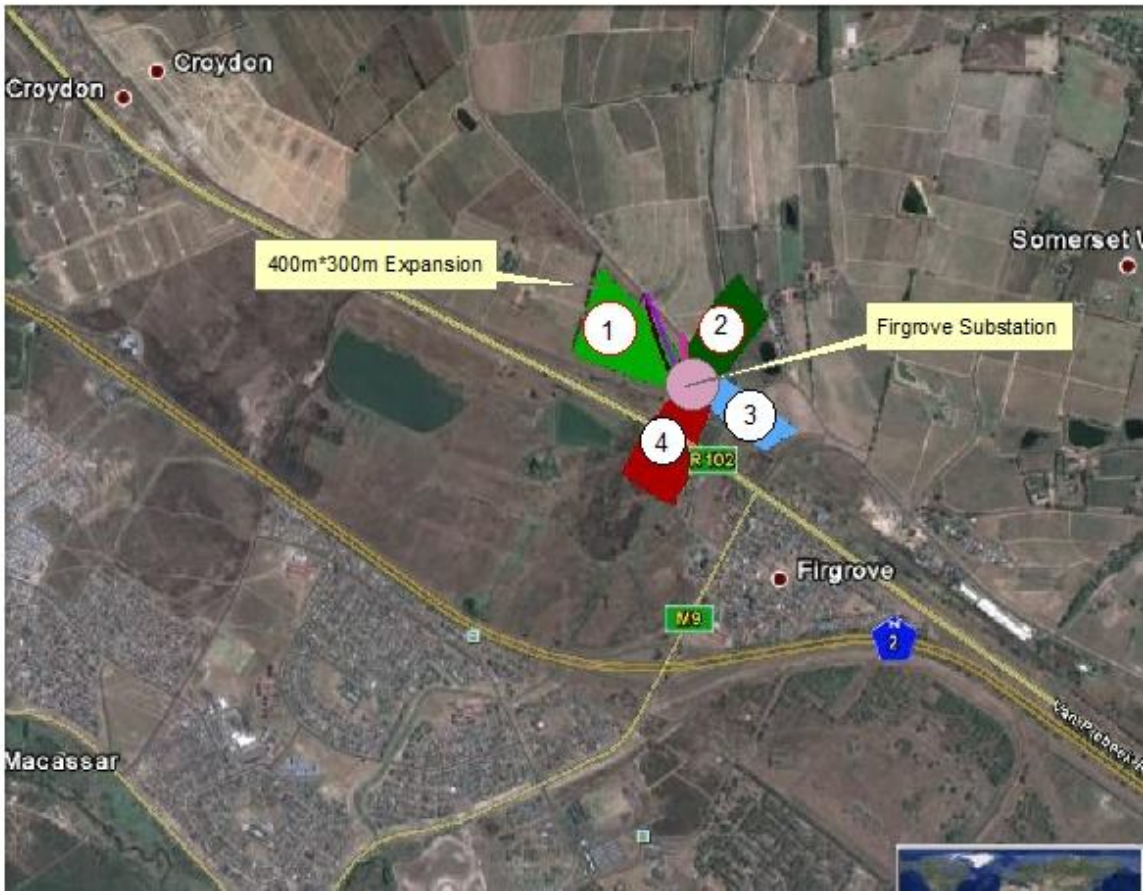

Figure 1: Locality map of the proposed site

5. Description of the environment that may be affected

5.1 Physical environment

5.1.1 Climate

According to Wikipedia Encyclopedia, the climate of Firgrove which is one of the suburbs in Cape Town, is Mediterranean with mild, wet winter and dry and very warm summers. During winter which occurs between May and September, large cold fronts come across from the Atlantic Ocean with heavy precipitation and strong north-westerly winds. The winter months are cold with an average minimum of 7.0ºC (45°F) and maximum of 17.5ºC (63ºF).

Most of the annual rainfall occurs in winter time, but due to the mountainous topography of Cape Town, rainfall amounts for specific areas can vary drastically. The valleys and the Coastal plains average 515millimeters (20.3in) of rain per annum, while mountain areas can average as much as 1.500milliliters (59 in) per annum. The minimum rainfall is 14mm and the maximum is 93mm.

Summer which occurs from November to March is warm and dry. The Cape Town and suburbs get frequent and strong winds from the south-east, known locally as the Cape Doctor because it blows away pollution and cleans the air, Summer temperatures is a maximum of 26.5ºC (80ºF).

South Africa Weather / South African Weather Charts							
Month -	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	Average over 14 yrs
Cape Town	26/16	26/16	25/14	22/12	19/09	18/08	Average Daily Max - Min ºC
Cape Town	15	08	18	48	79	84	Rainfall (in mm)

Month -	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	Average over 14 yrs
Cape Town	17/07	18/08	18/09	21/11	23/13	24/14	Average Daily Max - Min ºC
Cape Town	89	66	43	31	18	10	Rainfall (in mm)

The mean annual rainfall varies between 350 to 650 mm, occurring in summer. Precipitation generally occurs in the form of convectional thunderstorms that delivers up to 90% of the annual rainfall during the warm to hot summer months between October and March of the successive years. Temperatures range from -8 ˚C to 40 ˚C, with an average of 21 ˚C (Low & Rebelo, 1996).

5.1.2 Soil information

According to a research conducted on the study area different soil profiles were discovered. These include seasonal wet soil which indicates mottles due to the localization of Iron oxides, dark wet soil indicating permanent wet conditions, terrestrial soil adjacent to wetland area, and gleyed soil found in wet area. The wetland soils in Site 4 contained sandy soils within seasonal to permanent wetlands having accumulated high carbon content and reflected a dark chroma. The soil matrix chroma is 0-1. In some areas gleyed soils occurs as a result of prolonged saturated with water, the grey color is due to the absence of iron compounds. Seasonal wet soils has got mottling due to localization of iron oxides. The soils outside the wetland area are typical terrestrial soils that has got a uniform red color indicated a well-aerated soil.

Seasonal wet soils indicating mottles due to localization of iron oxides

Dark wet soil indicating permanent wet conditions

Terrestrial soil adjacent to wetland area

Gleyed soils found in permanent wet areas.

Figure 2: Soil Types found in the study area

5.1.3 Visual aspect

The proposed upgrade could have a negative visual impact to the surrounding area and this could affect the value of existing properties in the area. The current site is an existing substation which had already disturbed the landscape hence, an upgrade of the substation will not create much difference in terms of visual impact.

5.1.4 Wind direction and speed

Month of year	**Jan 01**	**Feb 02**	**Mar 03**	**Apr 04**	**May 05**	**Jun 06**	**Jul 07**	**Aug 08**	**Sep 09**	**Oct 10**	**Nov 11**	**Dec 12**	**SUM 1-12**
Average Wind speed (Knots)	14	13	12	10	9	9	9	10	11	12	14	14	**11**
Average air temp. (°C)	24	24	23	20	18	15	15	15	17	20	21	23	19

NW	NNW	N	NNE	NE	SE	SSE	S	SSW	SW	WSW	WNW
13	8	4	3	8	4	11	21	9	5	2	9

5.1.5 Topography

The topography of the study area is diverse. The West of the existing substation is moderately flat, the North is composed of a gentle slope , moderately undulating area and an access road to the water treatment plant, the East is also moderately undulating and has a valley in which the stream flows, the South is moderately flat and has a railway line and road R102.

Figure 3: Image showing the topography of the proposed site

5.2 Biotic environment

5.2.1 Flora and Fauna

According to specialist report the study area falls within the Critically Endangered Renosterveld and the vegetation unit in the study area is classified as Swartland Shale Renosterveld and Swartland Granite Renosterveld. Renosterveld is characterized by the dominance of Asteraceae, Renosterbos being the most important and where the vegetation type gets its name. Unlike Fynbos, grasses may also be abundant in Renosterveld. Another feature of Renosterveld is the high species richness of geophytic plants, mainly Iridaceae, Liliaceae and Orchidaceae.

The terrain associated with the study area is moderately undulating and the vegetation has been completely modified for agricultural lands. This high fertility of Renosterveld meant that most of the area has been converted to agriculture. Less than 10% of Swartland Shale

Renosterveld still remains intact, with other Renosterveld types also heavily ploughed or used as augmented pasture. Only remnants of this vegetation unit have remained intact as small islands between agricultural lands and conservation targets are no longer attainable in these areas. As a result of this transformation, the study area has been invaded by a high number of invasive alien species, weeds as well as several volunteer crops and very few indigenous species still occur in this area. Several plants recorded in the study area are classified as high-priority alien invasive species (Category 1b) requiring compulsory control. The dominance and aggressive growth of alien and invasive grasses such as kikuyu in the study area has largely displaced the rich diversity of geophytes expected to occur in the Renosterveld.

Small mammal species richness, diversity and abundance tend to be very low in cultivated and areas invaded by alien plant species compared to the adjacent remnant vegetation. The study area is completely transformed and is unlikely to support a significant diversity of small mammals of concern. Evidence of striped mouse (*Rhabdomys pumilio*), common mole rat (*Cryptomys hottentotus*) (Figure 15) and Cape gerbil (*Tatera afra*) activity were evident in the study area. The introduced grey squirrel (Sciurus carolinensis) has also established in the area.

The study area is not considered to be of critical importance for amphibians or reptiles. Taking into account the transformed state of the study, the majority of the frog species are expected to consist of the common, wide-spread and generalist species such as the common platanna *Xenopus laevis*, the Cape river frog *Afrana fuscigula*, raucous toad *Bufo rangeri*, the clicking stream frog *Strongylopus grayii* and the common caco *Cacosternum boettgeri* (Baard & de Villiers, 2000).

5.2.2 Agricultural potential

The main agricultural practice in Firgrove is food crop and wine farming. Alternative 1 and 2 of the study area are food crop and wine farms respectively. Wine farming plays a great role in the cultural identity of Cape Town which is recognized world wide as a great wine producing Province. On the other hand food crop cultivation is very essential for the sustainability of food supply. However alternative 1 appears degraded and consequently

yields low productivity, hence the use of the land for the expansion of the substation will be of less significance.

5.2.3 Wetland

A wetland assessment study conducted on the proposed site revealed two palustrine wetland types in the study area which can be described as a non-channeled valley bottom and a channeled valley bottom wetland. The wetland soils encountered during the survey displayed signs of wetness within 50cm of the surface. Soils in these wetlands displayed typical hydro-morphic characteristics varying between temporary, permanent and seasonal wet characteristics. Permanent inundation occurred in patches indicating wetlands south (Site 4), east (Site 3) and north east (Site 2) of the existing power station largely associated with the watercourse. The presence of a restrictive clay layer (such as bedrock or dense clay) in the soil slowed or prevents the infiltration of water at Site 3. These sections of the wetland can be described as"perched wetlands", receiving water mainly via rainfall or overland runoff, and most likely not from groundwater. The permanent wet soils in this valley bottom wetland are a dark highly organic soil. The wetland soils in Site 4 contained sandy soils within seasonal to permanent wetlands have accumulated high carbon content and reflected a dark chroma. In some areas gleyed soils occurs as a result of prolonged saturated with water, the grey color is due to the absence of iron compounds. The soils outside the wetland area are typical terrestrial soils with a uniform red color indicating well-aerated soils.

5.3 Socio-economic environment

5.3.1. Livelihood

Firgrove is predominantly an agricultural region which consists of both subsistence and agricultural farming. However there are a few businesses operating within the vicinity of the study area. There is a small scale shopping centre about a kilometre of the study area and the Ridgemore wine resort which is about 200m from the study area. There is a possibility of an increase in businesses due to an increase in population that is likely to result from an increase in the voltage supply.

5.3.2 Infrastructure and services

All infrastructures existing in alternative 2 and 3 will be impacted if any of these alternatives should be identified as the final chosen sites. Various divisions within the municipality have indicated that there are some existing infrastructure within the three alternatives that is alternative 2, 3 and 4.

5.3.3 Archaeological and culturally heritage

Stellenbosch, Summerset West and Gordon Bay are areas known to contain stone artefacts dating to the early Stone Age which has been found throughout the wine lands and the Eerste River valley. There is a minimum chance that the stone artefacts could be discovered during excavation in the construction phase of the project.

The cultural landscape of the Cape Vineyard which is under threat from housing and industrial development is of greater concern. The study area is characterised by wine farm which is at the verge of been classified as high priority activity by South African Heritage Resource Agency to maintain the cultural identity of Western Cape.

5.3.4 Air quality

The proposed Firgrove MTS substation upgrade will not have any major impact to the air quality in the surrounding. However during construction activities such as a regular movement of heavy construction vehicle on a gravel road could create dust on continuous bases resulting into a negative impact to the surrounding environment. Improper stock piling of construction soil on site could lead to an air quality pollutant during windy weather conditions.

Spraying of water at certain interval on the gravel access roads is a cheaper dust suppression measure which could be applied on site. The soil storage areas should be in a location that will not promote the spread of dust.

5.3.5 Traffic

All roads within the vicinity of the site will be impacted even if alternative 1 is the final chosen site for the proposed development. There will be a disturbance of traffic during construction phase which will occur due to the transportation of heavy construction vehicle and construction activities which may lead to road closures/ lane restriction on the road. The road R102 is the main roads to the Airport and Cape Town CBD therefore an impact on this road could affect a lot of road users during construction. The railway line belongs to Metrorail which could affect a lot of commuters if it is to be suspended during certain hours. The access road to Faurie Water Scheme could be affected if the road is to be completely closed during construction activities since the water purification plant will not be accessible.

The roads and transport division of the City of Cape Town should be informed way in advance if any road has to be affected. The Western Cape Metrorail Office should also be included in all correspondence. Any activity that may affect the railway line operation should be communicated to the City of Cape Town Metrorail. Site notices should be placed on the road informing road users and commuters about any planned closures on the road.

5.3.6 Noise

The current notice status in the proposed site is very minimal. It results from the existing transformer and traffic. During construction and operational phases the noise level could increase and it may affect the surrounding environment negatively. During operation phase there could be an increase in noise as a result of additional generators in the substation however the expected increase in noise will not exceed accepted standard in terms of noise level (decibels) in an environment.

All construction works that generates a high quantity of noise should be limited to working hours between 08H00 and 17’h00.

5.3.7 Safety

Safety is at the moment not a major problem on the proposed site but during construction this could change since most construction site tends to attract criminal elements. In order to ensure that safety measures are put in place and effective all contractors employees should be identifiable with name tags. Contractors should bring their own security companies to ensure that unauthorized entrance is restricted on site. Emergency numbers such as police and ambulance should be made available. Employees should also take responsibility of ensuring that any stranger amongst themselves is identified and reported to security for questioning. Neighbouring or surrounding houses and properties on site should be requested to report to the security officers appointed by the contractor if they find a stranger roaming around the area or even engage the police if the situation could be life threatening.

5.3.8 Visual impact

The proposed upgrade could have a negative visual impact to the surrounding area and this could affect the value of existing properties in the area. The current site is an existing substation which had already disturbed the landscape hence, an upgrade of the substation will not create much difference in terms of visual impact.

5.3.9 Vegetation

The study area is a disturbed environment with varying land use types. Renosterveld which was the original vegetation of the site is extinct and the site is currently invaded by alien plant species according to specialist report.

6 Details of the public participation conducted

In April 2006 the Minister of Environmental Affairs and Tourism passed regulations in terms of chapter 5 of the National Environmental Management ACT, 1998 (Act No. 107 of 1998 (“NEMA”) . The regulations replace the environmental impact assessment (EIA) regulations that were promulgated in terms of the Environmental Conservation Act, 1989 (Act No. 73 OF 1989) in 1997 and introduced new provisions regarding environmental management frameworks.

The guidelines form part of the department's Integrated Environmental Management Guidelines Series and consist of four parts, namely:

Guideline 1: General guide to the EIA Regulations.

Guideline 2: Public participation.

Guideline 3: Assessment of alternatives and impacts and alternatives.

Guideline 4: Environmental management frameworks.

Provide information guidelines for applicants, authorities and interested and affected parties (I&APs) on the public participation requirements of the regulations as described in Chapter 7 of the EIA regulations.

6.1 Public Consultation.

The objective of this part of the report is to provide a detail account of the Public Participation Program within the EIR phase. This stems from the requirement that people have a right to be informed about potential decisions that may affect them and that they must be offered an opportunity to influence those decisions. The public participation process will be conducted as follows:

6.1.1 Approach and methodology.

The broader framework in which the environmental investigations are conducted is Integrated Environmental Management (IEM). A definition provided by the Department of Environmental Affairs and Tourism (DEAT) 1998 for IEM reads as follows:

"IEM is a combination of proactive and preventative processes and procedures that maintain the environment in good condition for a variety of short and long range sustainable uses."

In order to ensure that the IEM is incorporated into a development process, it is necessary to identify issues and understand associated impacts. Thus, it is important that during the

planning phase, a process designed to identify issues, is conducted in the public domain, allowing I& A P's the opportunity of participating in this process.

6.1.1.1 Written notices.

Written letters were issued to stakeholders and the authorities concerning the public meeting date for the Environmental impact assessment phase. Further correspondences were made via emails, faxes and telephonically with Interested and Affected Parties regarding the public meeting and the commencement of the 30 day comment period.

6.1.1.2 Site notice.

On the 01 March 2011 posters were put on the proposed site and prominent public places to inform the public about the public meeting and comments period. The notice was 60cm by 42cm in size and displayed the required information in letters 6mm in height.

6.1.1.3 Media advertisement.

On the 25 February 2011 we made a publication through Daily Sun and Beeld news papers regarding the public meeting which is scheduled to hold on the 10th of March 2011

6.1.2 Principle of public participation process.

As the public participation programme is an integral part of the Integrated Environmental Management (IEM), the same IEM Principles should be applied.

IEM principles, as listed by the DEA (1998) and which are most relevant to the Public Participation Programme include:

- Meaningful and timorous participation of I & APs
- Focus on important issues
- Due considerations of alternatives
- Accountability for information used for decision making
- Encouragement of co-regulation, shared responsibility and sense of ownership

- Dispute resolution
- Application of due process particularly with regard to public participation in environmental governance provided for the Constitution
- Inclusively: the needs, interests and values of I&APs must be considered in the decision-making process

The external communication function performed by Public Participation is both proactive and reactive in nature, and can best be described in terms of these categories:

- Meetings
- Services
- Products

6.1.3 Public meeting.

The public meeting will be conducted on the 10th March 2011 as required by the NEMA regulations. The purpose of the public meeting was to provide appropriate platform to for I&AP to raise issues and to inform I&AP's about the proposed development. A full attendance register was taken at the public meeting.

6.1.4 Services

Enkanyini Projects will provide the following services:

- Registration of comments from I&APs though attendance registers at the Public meeting and invitations to register extended in the Background Information Document, individual letters and faxes and media advertisements. I&APs were also identified from existing data bases. A copy of the attendance register taken at the public meeting is available in Appendix D6.
- Provide feedback to I&APs, individually and collectively
- Provide assistance, where requested to I&APs in order to facilitate the understanding of the Environmental Impact Assessment process.
- Distribute draft document to key stakeholders and also placed in accessible public spots and local government offices for public review.

- Provide continuous assistance, where requested to I&APs in order to facilitate the understanding of the EMP so that I&APs have the opportunity to provide meaningful comment.

6.2 Interested and affected parties document registration.

6.2.1 Discussion with the interested and affected parties.

Will be captured after the meeting

6.2.2 Recommendation.

Will be made after the public meeting

7 Description of the needs and desirability

7.1 The need and justification for the proposed project

The project is intended to improve on the current electricity supply. The 2x500MV, 400/132 kV transformers at Stikland are now exceeding N-1 firm limit of 500MVA during peak demand. The 132kV networks currently supplying Firgrove are running at the thermal limit during peak demand. It is also difficult to carry out maintenance work on the 132Kv networks as the existing networks no longer comply with N-1 criteria

7.2 The benefits from the upgrading of Firgrove MTS substation and Palmiet Stikland loop-in loop-out is to:

- Reduction in electricity cut offs during maintenance periods
- Increased electricity supply
- Will stimulate increase in business opportunities
- Casual job creation during the construction phase

7.3 Overview of alternatives

Various portions of land were investigated including farm 664 portion 7 of farm Zandvliet, farm 664 portion 70 of farm Zandvleit, farm 664 portion 93 of farm Zandvleit and farm 1101, remainder extent of farm Zandvliet for the proposed development. The

suitability of the land for expansion was determined by certain parameters which included sensitivity and value of the land amongst which the topography, flora and fauna composition of the land, land capability, geology etc were considered.

7.3.1 Identified portions

The identified alternatives in the above Figure were investigated to determine their suitability for the proposed expansion of the substation in Firgrove. The identified alternatives will be described below bringing out the factors which makes either of the land suitable or not suitable for the proposed project.

Alternative 1: Alternative 1 is characterized of agricultural and grassland. It is the most suitable alternative for the expansion as confirmed in all the specialist research. It will result in less social, economic and environmental impact when converted.

Alternative 2: Alternative 2 is composed of an access road to the water treatment plant, a bulk pipe which transport water to the treatment plant, a wine farm, and transmission lines. Adopting this option will be costly economically and environmental. It will imply the diversion of the access road and the bulk pipeline. It will also result in converting the wine farm which is fast becoming a center of Cape Town's heritage.

Alternative 3: Alternative 3 is a wetland area. Giving the ecological significance of the wetland which acts as a habitat for some micro organism and species of plants, this important value will be disturbed if this option is considered for the expansion.

Alternative 4: Alternative 4 is composed of a few residential houses, road R102, a rail line and a dam. This option will be the least preferred due to the huge social, economic and environmental cost involved in transforming the area.

The table below shows the most considered influential factors/impacts in choosing the most preferred site.

High = 5 Medium = 3 Low = 1

Issue considered	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**
Ecological function of the site	Low	Medium	High	Medium
Conservation importance	Low	Medium	High	High
Heritage site	Low No heritage site identified	Medium A potential heritage site	Low No heritage site identified	Low No heritage site identified
Archeological significance	Low	Low	Low	Low
Site location	The area is relative flat and suitable for the expansion	The area is undulating	The area is a gentle slope which could promote the occurrence of soil erosion	The area is undulating
Social and economic impact on the surrounding as well as beneficiaries	The social and economic impact will be low because the land is an agricultural land with declining productivity	The social and economic impact will be high due to the type of land uses which occur on this land, converting them will be more costly economically and socially	The social and economic impact will be medium because of the ecological significance of the wetland	The social and economic impact will be high because converting the land will imply interrupting the railway and road R102 which are means of transporting people and goods. It will also lead to the displacement of the people who are resident in the houses situated in this alternative
Storm water management (system) on site	No storm water management system in place but it is manageable	No storm water management system in place but it is manageable	No storm water management system in place but it is manageable	No storm water management system in place but it is manageable
Soil /Geology	Low-the soil has lost its	Medium- the soil is rich and	Medium- the soil is	Medium the soil is also wet and

	fertility and is affecting the productivity of the land. The land is fairly flat	favours wine cultivation. The land is undulating	permanently wet hence not suitable for construction. The land is slanting and may promote the occurrence of erosion if interfered with	unsuitable for construction and the land is undulating

The most preferred portion is alternative 1 for the proposed expansion of the Firgrove substation.

Alternative 1: Agricultural land

Alternative 2: Access road to a water treatment plant, a wine farm, 3m diameter pipe line servitude and the current Stikland/Palmiet transmission line

Alternative 3: Wetland

Alternative 4: Residential area (rental houses, a church and houses along the road), railway line and R102 road.

7.3.2 Second Option: The no go option.

If the Department of Environmental Affairs and Tourism do not approve the application for expansion there will be

- An increase in electricity cut offs during maintenance periods due to increase in demand for electricity with the increase in population
- A reduction in electricity supply
- A reduction in business opportunities
- A loss in an opportunity to create casual jobs during the construction phase

8 Identifying Significance of Potential Environmental Impact

In this section the significance of potential environmental impact for all the four alternative portions under investigation, will be identified.

8.1 Methodology and impacts

The approach in describing and assessing the identified environmental issues is discussed below. Also presented is a brief description of how these impacts were identified and rated. The definition of term used in this section is on pages 74-78

A description of the nature of potential issues will be based on:

- General background and context within this application
- Causes and effect
- Who or what will be affected
- How it will be affected

Assessment of the impact in terms of:

- Probability
- Extent
- Duration
- Magnitude
- Reversibility

The table below shows the approach and the method used to identify assess and rate environmental impacts associated with the proposed activity.

Potential issue	Criteria	Description of elements that are central to each issue
Description	Nature	What causes the effect?
		Who will be affected?
		What will be affected?
		How will it be affected?
	Probability	Certain / may not occur with mitigation
	Status	Positive, negative or neutral.
Assessment	Extent	Is the impact site specific

		Does the impact extend locally, i.e. to the site and its nearby surroundings?
		Does the impact extend regionally, i.e. have an impact on the region.
		Does the impact extend nationally, i.e. have an impact on a national scale.
	Duration	Short term, i.e. 0-5 years.
		Medium term i.e. 5-11 years
		Long term, i.e. impact ceases after the construction or operational life cycle.
		Permanent, i.e. mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.
	Magnitude	Low, i.e. natural and social functions and processes are not affected or minimally affected.
		Medium, i.e. affected environment is notably altered. Natural and social functions and processes continue albeit in a modified way.
		High, i.e. natural or social functions or processes could be substantially affected or altered to the extent that they could temporarily or permanently cease.
	Reversibility	Impact is reversible or irreversible.
	Cumulative or non-cumulative	Potential of two or more impacts to combine to form cumulative or synergistic impacts.

ASSESSMENT OF THE ISSUES

8.1.1 Noise

It is expected that the construction activities will create noise pollution in the area during working hours. The proposed site is currently being affected by occasional noise from the train mobility along the rail and traffic on the R 102 road. There will be an increase in noise as a result of mechanical work to be done and heavy transport movement during

construction phase. Exposure to noise intensity above 85db (A) for eight hours has the potential to cause hearing damage. The activities associated with the proposed development will generate limited noise intensity that can hardly cause hearing damage to humans. On the other hand, workers who will be involved in jobs that generate level of noise such as welding activity should be provided safety equipment to protect their ears from noise damage.

Assessment of the issue

Consideration and Assessment / Comment
Nature
There is a railway and a main road on the surrounding of the proposed site.
Probability
The probability of change is certain with regard to the potential sources of noise pollution during construction and operation phase if the development were to go ahead.
Status
An increase in noise pollution would be a negative impact to the surrounding.
Extent
Impacts would be site specific and in the local environment.
Duration
Medium, however an increase in noise will only be during the construction phase due to construction vehicles or activity.
Magnitude
Medium, due to site nature, the effects are likely to be low.
Reversibility
Reversible. When the construction is completed the noise level would return to the initial state
Cumulative/Non cumulative
Cumulative

8.1.2. Dust

Dust creation is inevitable in the area during construction as a result of cleared vegetation.

Assessment of the issue

Consideration and Assessment / Comment
Nature
The current site used for agricultural purposes is less affected by dust

Probability
The probability of change is certain due to movement of heavy trucks transporting construction materials and clearing of the vegetation for construction
Status
An increase in dust will impact negatively on the surrounding environment.
Extent
Impacts would be site specific and in the local environment.
Duration
Medium, however an increase in dust will only be during the construction phase due to construction vehicles or activity.
Magnitude
Low, due to site nature, the effects are likely to be low.
Reversibility
Reversible. When the construction is completed the dust level would return to the initial state
Cumulative/Non cumulative
Cumulative

8.1.3. Soil erosion

The construction activities for the proposed substation upgrade have the potential to create soil erosion as a result of cleared vegetation which exposes the ground soil, improper stock piling of soil and movement of heavy construction vehicle around the area.

Assessment of the issue

Consideration and Assessment / Comment
Nature
There is vegetation covering most of the land which reduces soil erosion on site.
Probability
The probability of change is certain due to the clearing of vegetation during the construction phase if the development were to go ahead.
Status
An increase in soil erosion would be a negative impact to the surrounding and may be worsen if storm water is not properly addressed.
Extent
Impacts would be site specific and in the area where the vegetation will be cleared.
Duration

Medium may occur even after construction due to the absence of vegetation cover.
Magnitude
Medium, due to the undulating nature of the site the effects are likely to be medium.
Reversibility
Reversible. When the construction is completed and the storm water management is in place, erosion will be reduced
Cumulative/Non cumulative
Noncumulative if the proposed development design addresses storm water management issues

8.1.4. Waste disposal

Uncontrolled and careless disposal of waste has a deteriorating effect on the health status of the local environment. It will also result in soil, surface and ground water contamination, among others. Waste will result during construction and operation phase. This includes the waste generated from construction such as waste material, off cuts, mobile toilets, during construction phase. At this stage there is illegal dumping being experienced on site. During construction if waste is not properly addressed the impact could increase affecting the existing wetland on site resulting in series of negative environmental impacts.

Assessment of the issue

Consideration and Assessment / Comment
Nature
The site is currently affected by illegal dumping of waste by inhabitants of the houses beside the existing substation.
Probability
The probability of change is uncertain.
Status
An increase in waste and improper disposal may result in the establishment of an illegal waste dumping site which in the long run may lead to serious environmental and health hazard.
Extent
Impacts would be site specific and in the local environment.
Duration
Short term, it may occur only during construction phase
Magnitude
Medium.
Reversibility

Reversible if well managed.
Cumulative/Non cumulative
Cumulative

8.1.5 Mixing of concrete

Concrete residue when left to harden could create areas, which will be difficult to remove or rehabilitate for the beneficiaries.

Assessment of the issue

Consideration and Assessment / Comment
Nature
The site is currently not affected by concrete slabs, dry concrete and cements mixtures since it is used for agricultural purposes
Probability
The probability of change is uncertain which may rise as a result of dry concrete mixture left during construction.
Status
If concrete mixing is not well managed and left to dry it may result to concrete slab formation and negatively impact the surrounding.
Extent
Impacts would be site specific and in the local environment.
Duration
This might permanently affect the soil.
Magnitude
Medium. The soil character might be changed.
Reversibility
Reversible, the cement residue could be removed and the area filled with top soil
Cumulative/Non cumulative
Non cumulative

8.1.6. Storage of equipment and construction materials

Equipment and materials if not stored in an appropriate manner during construction could be a source of pollution, accident or negative visual impact.

Assessment of the issue

Consideration and Assessment / Comment

Nature
The site is free of improper storage of construction material
Probability
The probability of change is uncertain.
Status
Equipment and materials if not stored in an appropriate manner could be sources of pollution, accident or negative visual impact.
Extent
Impacts would be site specific and in the local environment.
Duration
Short term may occur during construction
Magnitude
Medium, due to site nature, the effects are likely to be low.
Reversibility
If well managed can be reversible.
Cumulative/Non cumulative
Cumulative

8.1.7. Hazardous waste

Various hazardous materials, construction waste and by-products as thinners, and oils used during construction could become sources of pollution if not disposed of in an appropriate manner. If hazardous waste is not properly addressed this could lead into negative impacts which might affect the wetland area during rainfall.

Spillages of hazardous liquids such as fuel, engine oil and other liquids used during vehicle maintenance and equipment handling, on the ground surface could result in contamination of soil, surface and ground water.

Assessment of the issue

Consideration and Assessment / Comment
Nature
The proposed site is dominantly an agricultural area.
Probability
The probability of change is uncertain with regard to the potential hazardous waste.
Status
Hazardous spillages will result into an environmental pollution leading to a series of negative environmental impacts.

Extent
Impacts would be site specific and in the local environment.
Duration
Medium.
Magnitude
Medium, due to site nature, the effects are likely to be low.
Reversibility
Reversible. When the construction is completed spillages will no longer be an issue since , Eskom policies discourage spillages on site.
Cumulative/Non cumulative
Non cumulative

8.1.8. Vehicle refuelling and Maintenance

Spillages of hazardous liquids such as fuel, engine oil and other liquids used during vehicle maintenance and equipment handling, on the ground surface could result to contamination of soil, surface water and ground water.

Assessment of the issue

Consideration and Assessment / Comment
Nature
The nature of the site is free from fuel spillages
Probability
The probability of change is uncertain with regard to the potential hazardous waste.
Status
Oil/Hydrocarbons spillages would be a negative impact to the current environment.
Extent
Impacts would be site specific and in the local environment.
Duration
Short term
Magnitude
Low
Reversibility
Could be reversed through proper clean up
Cumulative/Non cumulative
Could be cumulative. Soil characteristic could change and species could be destroyed in the area.

8.1.9. Visual impacts

The erection of huge transformers will transform the landscape and result in negative visual impact. Building material waste and careless dumping of waste by workers will also cause an unpleasant visual impact.

Assessment of the issue

Consideration and Assessment / Comment
Nature
There is an existing substation already on site.
Probability
The probability of change is certain regarding the potential visual impact, if the development were to go ahead.
Status
The presence of construction could pose visual impact and the operational phase could also pose visual impact to the current owners of the existing residential.
Extent
Impacts would be site specific and in the local environment.
Duration
Medium, may prolong into the operation phase
Magnitude
Medium,
Reversibility
Nonreversible.
Cumulative/Non cumulative
Cumulative

8.1.10. Endemic flora and fauna

The remains of flora and fauna in and around the construction site will be affected by the construction activities in the process of Firgrove MTS substation upgrade. Flora and fauna in and around the construction site should be protected as much as possible.

Assessment of the issue

Consideration and Assessment / Comment
Nature
Flora and fauna have been impacted due to agricultural activities on site.
Probability
The probability of change is certain regarding the little life available
Status
The current state of the site which is already disturbed impacts negatively on to flora and fauna.
Extent
Impacts would be site specific and in the local environment, might extend to the region.

Duration
Permanent
Magnitude
Medium, due to site nature, the effects are likely to be low.
Reversibility
It could be reversible or rehabilitated
Cumulative/Non cumulative
Cumulative

8.1.11. Temporary job

It is important for the well being of the local community to use local labour where possible, and comply with the public requirement for the proposed development.

Assessment of the issue

Consideration and Assessment / Comment
Nature
A place/site where development is to be located, job seekers are always roaming around the area for employment.
Probability
The probability of change is uncertain.
Status
Un-employment has a negative effect in and around the local community. Not employing the local labours could impact the project negatively.
Extent
Impacts could be site specific and in the local community. However it could extend to national level.
Duration
Permanent
Magnitude
Not applicable
Reversibility
Not applicable
Cumulative/Non cumulative
Not applicable

8.1.12. Security and crime

Security on the construction site needs to be maintained. Construction work and related activities are usually associated with an increase in crime incidents in the area where development occurs.

Assessment of the issue

Consideration and Assessment / Comment
Nature
The site is currently adequately protected since there is an existing substation.
Probability
The probability of change is uncertain
Status
Crime is currently a problem, escalated by un-employment in the area. Construction site could invite more criminal elements since construction material would be on site.
Extent
Impacts could be site specific and in the local community however it could extend.
Duration
Temporal
Magnitude
Medium, due to site nature, the effects are likely to be low.
Reversibility
Reversible. When the construction is completed the crime extent would reduce
Cumulative/Non cumulative
Noncumulative

8.1.13. Fire Prevention and Control

Lighting up fire for comfort during winter, for cooking and smoking in and around the contractor's camp may pose fire threat. Therefore appropriate measures are to be taken.

Assessment of the issue

Consideration and Assessment / Comment
Nature
The site currently does not have any activities that may pose fire threats except out of natural cause.
Probability
The probability of change is uncertain.
Status
The proposed site is currently under low threat from fire but this might change during construction due to construction activities and workers' conduct
Extent
Impacts would be site specific and in the local environment.
Duration
Medium, increase in fire incidents may only occur during construction.

Magnitude
Medium, the impact could spread out resulting in the destruction of other nearby properties.
Reversibility
Irreversible
Cumulative/Non cumulative
Cumulative

8.1.14. Environmental complaint register

It is expected that there could be complaints with regards to environmental non-compliance during the construction phase of the project. The environmental compliant register should be made accessible to the entire community. Failure to establish an environmental complaint register could lead to boycotts and frustration of local community members who are dissatisfied with the manner in which activities taking place on site contravenes stipulated conditions in the environmental authorisation.

8.1.15. Safety and Access Control

Safety is a very important issue in construction because some construction activities exposes human and animal lives to risks. Therefore sufficient safety measures should be taken to avoid unnecessary accidents and or injuries

Assessment of the issue

Consideration and Assessment / Comment
Nature
Firgrove substation is well managed at this stage no major safety threats are present on site.
Probability
The probability of change is uncertain.
Status
The current site is safe and poses no threat as far as accident is concern but the use of unsafe equipments and improper handling of hazardous substances may jeopardize the safety
Extent
Impacts would be site specific and in the local environment.
Duration
Medium, may extend to operation phase if not properly managed
Magnitude
Medium, safety may become an issue and even affect lives if not properly managed
Reversibility
Irreversible. If not properly managed

Cumulative/Non cumulative
Cumulative

8.1.16. Borrow pits and spoil areas

Any spoil areas or borrow pits established on site as a result of construction may change the natural characteristic of the site and depending on the size of a spoiled area it could affect the beneficiaries negatively.

Assessment of the issue

Consideration and Assessment / Comment
Nature
The current site does not have illegal excavation or furrows.
Probability
The probability of change is certain during construction phase the site may be affected by borrow pits and spoil areas.
Status
If the spoil material is not properly managed, it could negatively impact the environment. Storm water channeling could be affected and injuries could result when there is poor visibility in the area.
Extent
Impacts would be site specific and in the local environment.
Duration
Short term, will occur during construction phase
Magnitude
Medium
Reversibility
Reversible. When the construction is completed all the borrow pits will be rehabilitated
Cumulative/Non cumulative
Cumulative

8.1.17. Storm water runoff

Uncontrolled storm water runoff could create various problems such as soil erosion and disturbance of wetland areas. If no proper storm water management system is put in place there could be potential river pollution.

Assessment of the issue

Consideration and Assessment / Comment
Nature
There is an existing wetland on site but no existing storm water management plan

Probability
The probability of change is uncertain if no proper storm water management plan is put in place
Status
If storm water is not addressed in the construction phase, during rainy season water would either over flow or will cause soil erosion and that will impact the environment negatively.
Extent
Impacts would be site specific and in the local environment.
Duration
Short term
Magnitude
Medium
Reversibility
Not applicable
Cumulative/Non cumulative
Noncumulative

8.1.18. Survey Points

The surrounding environment should be taken into consideration when survey operations are to be performed. The site boundaries are given and need to be clearly pegged in order to avoid unnecessary disturbance of the environment or clearance of vegetation.

Assessment of the issue

Consideration and Assessment / Comment
Nature
The site boundaries are given and need to be clearly pegged.
Probability
The probability of change is certain.
Status
If boundaries are not clearly demarcated, construction activity can have impact on neighboring site.
Extent
Impacts would be site specific and in the local environment.
Duration
Short term
Magnitude
Low
Reversibility

Reversible
Cumulative/Non cumulative
Noncumulative

8.1.19. Construction Camps

The choice of site for the contractors' camp requires the Environmental Control Officer and Engineers permission and their decision should take into account location of local residents and or ecological sensitive areas. Construction camps could be associated with a series of negative environmental impacts such as negative visual impacts, clearance of vegetation on non demarcated area, source of environmental pollution in the area etc.

Assessment of the issue

Consideration and Assessment / Comment
Nature
The site is free from hazardous substances and material.
Probability
The probability of change is uncertain.
Status
Construction camps are associated with environmental impacts, if not properly selected and managed.
Extent
Impacts would be site specific and in the local environment.
Duration
Medium term
Magnitude
Medium
Reversibility
Reversible. When the construction is completed the site camp will be rehabilitated
Cumulative/Non cumulative
Noncumulative

8.1.20. Workers' conduct on site

A general regard for the social and ecological well-being of the site and adjacent areas is expected of the site staff. Unacceptable behaviour of workers (especially after hours) on site could affect the surrounding environment negatively.

Assessment of the issue

Consideration and Assessment / Comment
Nature
Firgrove substation is situated close to some private residences and crop farms
Probability
The probability of change is uncertain depending on the workers behavior.
Status
Workers conduct could have a negative impact on the surrounding neighbors and town.
Extent
Impacts would be site specific and in the local environment.
Duration
Medium the impact may increase during construction
Magnitude
Low if proper discipline is put in place
Reversibility
Reversible.
Cumulative/Non cumulative
Noncumulative

8.1.21. Lighting

Lighting on site is to be set out to provide maximum security and to enable easier policing of the site, without creating a visual nuisance to local residents or business.

Assessment of the issue

Consideration and Assessment / Comment
Nature
There is an existing substation and lighting in the area does not pose negative impacts
Probability
The probability of change is certain.
Status
If lighting is not well placed there could be a creation of visual nuisance to local residents or business.
Extent

Impacts would be site specific and in the local environment.
Duration
Short term
Magnitude
Low
Reversibility
Reversible.
Cumulative/Non cumulative
Noncumulative

8.1.22. Ablution facility

If ablution facilities are not provided on site employees would use the open spaces to relieve themselves and that would impact the environment negatively.

ASSESSMENT OF THE ISSUE

Consideration	**Assessment / Comment**
Description	
Nature	There are toilet facilities on site in the current existing Firgove substation.
Probability	The probability of change is certain.
Assessment	
Status	In the absence of ablution facility and improper management of the facility the surrounding environment will be negatively impacted
Extent	Impacts would be site specific and in the local environment.
Duration	Short term
Magnitude	Low
Reversibility	Reversible
Cumulative/Non cumulative	Non-cumulative

8.2 Proposed mitigation and management

The table below is an illustration of the criteria utilised to define the proposed mitigation and management of the mitigation. The table further illustrates the timeframe for mitigation to be effected and the responsible party.

No	Mitigation	Impact and proposed mitigation and management actions	Responsibility	Timeframe
	Potential to mitigate negative impact	Description of mitigating measures. Extent to which mitigating measures could influence the significance and status of impact. Where ever possible a description of the optimization measures. Extent to which they could influence the significance of impact.	The responsible person to ensure that the mitigation measures are taken.	Implementation period for the mitigation
	Potential to enhance positive impacts			
	Comment on the overall assessment and conclusion.	Overall Assessment and concluding comments on the predicted impacts after mitigation: o Severity and permanence o Size and relative significance o Ecological and socio – economic context o Balance between positive and negative aspect o Cost and benefits o Acceptability / Unacceptability		
	Magnitude of and impact after mitigation measures are applied	• Low, i.e. natural and social functions and processes are not affected or minimally affected. • Medium, i.e. affected environment is notably altered. Natural and social functions and processes continue albeit in a modified way. • High, i.e. natural or social functions or processes could be substantially affected or altered to the extent that they could temporarily or permanently cease.		

	Mitigation	Impact and proposed mitigation and management actions	Responsibility	Timeframe
1.	Potential to mitigate negative impacts	**Noise**: • Construction and other noise generating activities should be restricted to between 06h00 and 18h00 Monday to Friday, unless otherwise approved by the appropriate competent person in consultation with adjacent landowners/affected persons and ECO. • During the operational phase all activities must take place in a manner that will allow as little noise as possible. • Activities, which are deemed to generate high levels of noise, will be restricted to normal working hours. • Workers who will be involved in jobs that generate high level of noise such as welding activity should be provided safety equipment to protect their ears from noise damage	Contractor. Contractor. Contractor.	During construction
	Potential to enhance positive impacts	It is not applicable		
Comment on the overall assessment and conclusion.		If construction vehicles are serviced and properly maintained the level of noise should be less.		
Magnitude		Low.		

2.	Potential to mitigate negative impacts	**Dust:** • The liberation of dust into the surrounding environment shall be effectively controlled by the use of, water spraying • The speed of haul trucks and other vehicles must be strictly controlled to avoid dangerous conditions, excessive dust or deterioration of the road being used. • Site clearance to be done only as needed in phases. • Vehicle transporting materials must be covered with tarpaulin to reduce dust	Contractor. Contractor. Contractor. .	During construction
	Potential to enhance positive impacts	Not applicable		
Comment on the overall assessment and conclusion.		Spraying of water during working hour should reduce the dust level and stock piling of soil should be avoided where ever possible.		
Magnitude		Low		

3.	Potential to mitigate negative impact	**Soil:** • Submission of an operational plan for the construction phase indicating technical and management measures to prevent soil erosion. • Stock piled topsoil should not be compacted and should be replaced as final soil layer. • Soil should be exposed for the minimum time possible once cleared of vegetation, i.e. the timing of clearing and grubbing should be co-ordinated as much as possible to avoid prolonged exposure of soils to wind and water erosion. • The A-horizon will be removed and used for rehabilitation purposes. The lower soil horizons will be used for construction activities. The A-horizon will be stockpiled in a responsible manner and replaced during rehabilitation.	Contractor. Contractor. Contractor Contractor	During construction phase.
	Potential to enhance positive impacts	Not applicable		
Comment on the overall assessment and conclusion.		The design lay out plan should address all issues relating to storm water management and soil erosion. This could completely mitigate against soil erosion.		
Magnitude		Low		
4.	Potential to mitigate negative impacts	**Disposal of sewage:** • The contractor to install adequate portable chemical toilets to meet the sanitation needs on the construction site (14 people per toilet).	Contractor.	During construction .

		• All the toilets onsite must be serviced appropriately to ensure good hygienic condition and prevent the spread of disease		
	Potential to enhance positive impacts	Not applicable		
Comment on the overall assessment and conclusion.		Ablution facility should be made available during construction phase for the employee to relief themselves in time of need.		
Magnitude.		Low		
5.	Potential mitigate negative impacts	**Mixing of concrete:** • Where concrete has been mixed, especially in the natural environment, all residues must be removed and disposed of in an environmentally responsible manner approved by the ECO.	Contractor.	During construction .
	Potential to enhance positive impacts	Not applicable		
Comment on the overall assessment and conclusion.		Unused cement should not be left to dry on the ground. If proper housekeeping rules are complied with, most impacts should not affect the environment.		
Magnitude		Low		

6.	Potential to mitigate negative impacts	**Storage of Equipment and Materials:** • Choice of location for storage areas must take into account prevailing winds, exposure to sun, distance to water bodies and general onsite topology. • All equipments and materials must be stored in a designated area in an appropriate manner as to prevent pollution. • Storage areas must be designated, demarcated and fenced as effective as possible. • Fire prevention facilities must be present and accessible at all times.	Contractor. Contractor. Contractor. Contractor.	Through-out the life cycle of the project.
	Potential to enhance positive impacts	Not applicable		
Comment on the overall assessment and conclusion.		If employees on site shall practice good housekeeping behavior, there will be space for everything and the working condition will be free of injuries		
Magnitude		Low		
7.	Potential to mitigate negative impacts	**Waste generation and disposal:** • A waste management plan to be developed for the construction site. • Plan to ensure that all waste is contained in suitable containers to prevent waste being washed into water bodies. • Containers for waste to ensure that any fluids generated by waste are trapped and can be disposed of in a suitable manner • Bin containers with lids must be provided on site for the collection of waste	Contractor. Contractor. Contractor.	During construction

	Potential to enhance positive impacts	Not applicable		
Comment on the overall assessment and conclusion.		Waste removal should be done regularly and this could make the environment free from any hazards. If measures suggested are appropriately applied the impact could be completely mitigated.		
Magnitude.		Low		

8.	Potential to mitigate negative impacts	**Hazardous Substances:** • Hazardous materials to be stored correctly, marked, labelled, without the risk of contamination and hazardous waste to be disposed of correctly with the necessary certificates issued. • All oils, hydraulic fluids and other hazardous materials will be stored in suitable containers in a structure or facility designated for this purpose. • Material Safety Data Sheets (MSDSs) shall be readily available on site for all chemicals and hazardous substances to be used on site. • Storage areas containing hazardous substances must be clearly signed and the designated person contact and names should be displayed. • Residents living adjacent to the construction site must be notified of the existence of the hazardous storage area. • Staff dealing with these materials/substances must be aware of their potential impacts and follow the appropriate safety measures.	Contractor in co-operation with ECO. Contractor Contractor Contractor Contractor Contractor.	During construction .
	Potential to enhance positive impacts	Not applicable		
Comment on the overall assessment and conclusion.		Employees dealing with hazardous substances should be trained and be competent to do so. This could completely mitigate /reduce the risk posed by this impact.		

Magnitude		Low		
9.	Potential to mitigate negative impacts	**Vehicle Maintenance & Refueling:** • Vehicle maintenance and equipment handling to be carried out in areas especially equipped for this purpose in order to prevent spillage and contamination. • All oil changes, lubrication and maintenance will take place only at the designated areas. • Refueling of vehicles will and must take place at the designated refueling area. This area will have a sufficiently impermeable surface to prevent seepage into ground water. The refueling area will be bounded to prevent any surface water from running over this area.	Contractor. Contractor. Contractor.	During construction .
	Potential to enhance positive impacts	Not applicable		
Comment on the overall assessment and conclusion.		The impact should be completely mitigated or reduced from posing danger to the environment.		
Magnitude		Low		

10.	Potential to mitigate negative impacts	**Visual impacts:** • Waste (construction and domestic) must be disposed of in a proper manner and not allowed to be strewn around on site and surrounding areas. • Storage facilities elevated tanks and other temporary structures on site should be located such that they have as little visual impact on local residents as possible. • Special attention should be given to the screening of highly reflective materials on site. • The soil excavated must not be stockpiled above 2m but should be dumped in a designated area.	Contractor. Contractor. Contractor. Contractor.	
	Potential to enhance positive impact	Not applicable		
	Comment on the overall assessment and conclusion.	The new construction could have less visual impact because it will occur far away from residential and commercial areas		
	Magnitude	Low		

11.	Potential mitigate to negative impacts	**Endemic flora and fauna:** • No endemic flora and fauna species will be deliberately destroyed or permanently alienated from their natural habitat during construction. • Trenches left open during construction should be checked periodically such that animals which accidentally fall in can be safely removed and released away from construction activities. All trenches should be filled as soon as possible. • Construction staff should be advised not to chase, kill or catch animals found or encountered during construction. • Only vegetation falling directly in operational area should be removed where necessary. • No exotic/invasive plants are to be planted on common ground of the site. • No vegetation will be removed without prior permission from ECO. • Trees that are not to be cleared should be marked before hand with danger tape. The ECO must be given a chance to mark vegetation that is to be conserved before the contractor begins clearing the site.	Contractor and ECO. Contractor. Contractor and ECO. Contractor Contractor and ECO. Contractor and ECO Contractor and ECO	During construction .
	Potential to enhance positive impacts	Not applicable		
Comment on the overall assessment and conclusion.		Identified indigenous and protected plant species existing in the area should be protected by all means.		

Magnitude		Low		
12.	Potential to mitigate negative impacts	**Maintenance of access roads** • Access roads to be maintained with an acceptable surface free of erosion and surface water pond. • All access routes will be planned to make optimal use of existing roads.	Contractor maintains roads. ECO to audit status of roads.	During construction & maintenance Phase.
	Potential to enhance positive Impact	The roads will be in a better condition than the current state that will benefit the surrounding community.		
Comment on the overall assessment and conclusion.		The roads will be in good condition and safe if constantly maintained		
Magnitude		Low		

13.	Potential to mitigate negative impacts	**Labor force:** • Laborers to be restricted to construction area. • Access to the site should be restricted to employees of the contractor. • Temporary ablution facilities to be provided at appropriate sites (one toilet for 14 laborers). • Such ablution facilities to be kept away from natural water bodies. • Cooking facilities to be provided in demarcated areas. • All informal traders to be discouraged. • All labor will undergo basic induction, where safety, health and environmental issues will be discussed. • Construction staff should be educated, prior to commencement of construction, as to the need to refrain from destruction or killing of animals and plants, as well as from indiscriminate defecation, waste disposal and / or pollution of local soil and water sources. • The contractor should ensure proper supervision of employees at all times.	Contractor to identify suitable areas for the said facilities. Contractor to maintain the above facilities.	During construction .
	Potential to enhance positive impacts	If local labour is used, the local community will benefit		
Comment on the overall assessment and conclusion.		Skills and knowledge should be gained by those employees who assist in building local communities.		
Magnitude		Low		

14.	Potential to mitigate negative impacts	**Temporary jobs** Local labor and contractors must be used wherever possible. Basic skills development and capacity development must be incorporated in this program. It will be a specific condition in the contractors' agreements that local labor be used wherever possible. All reasonable attempts will be made to appoint people from the local communities as temporary laborers for non-specialized tasks and they will be subject to the necessary basic skills training.	Contractor.	During construction
	Potential to enhance positive impacts	Skilled local laborers will transfer skills to unskilled laborers and the local community will be empowered.		
Comment on the overall assessment and conclusion.		N/A		
Magnitude		N/A		
15.	Potential to mitigate negative impacts	**Construction Workers:** The following restriction will be placed on the construction workers: • No use of wetland areas, rivers or dams for washing; • No collection of sand for construction purposes; • No indiscriminate disposal of rubbish, construction waste; • No collection of firewood; • No damage to vegetation; • No use of open veld as toilet facility; • No burning of waste and cleared vegetation. • No harvesting of food crops from adjacent farms	Contractor.	During construction .

	Potential to enhance positive impacts	Skilled laborers with more experience will train community laborers employed to acquire skill. Training course should be made to ensure that a quality product is produced		
Comment on the overall assessment and conclusion.		If construction workers could be well managed and given induction that will include HIV awareness that should assist in alleviating the impact that could result from the workers.		
Magnitude		N/A		
16.	Potential to mitigate negative impacts.	**Security and crime:** • A security company to be appointed for the duration of the construction contract. Allowance must be made for the EMC to have access to the site as well as for relevant stakeholders. • The access of unauthorized individuals must be minimized.	Contractor.	During construction .
	Potential to enhance positive impacts	The improvement of safety and security in the proposed site will benefit the community already affected by criminal activities		
Comment on the overall assessment and conclusion.		Crime could be reduced or completely eradicated by the improvement of security system.		
Magnitude		Low		
17. `		**Fire protection:** • Contractor must make sure that there is supervision for all fires that are used in the construction camp. • Smoking should be prohibited in the vicinity of flammable substances. • The contractor should ensure that fire-fighting equipment is available on site, in particular where flammable	Contractor. Contractor. Contractor.	During construction

	Potential to mitigate impacts	substances are stored. • Fires made for comfort(warmth) should be discouraged by the contractor, due to the risk of vegetation fires and risk to adjacent property • Fire-fighting equipment and emergency plans must be in place prior to the construction phase. • The contractor will plan and implement a fire prevention program and develop a contingency plan in the event of any fire. • No refuse or waste may be burn on site. • The contractor will be responsible for all damages caused by the outbreak of a fire originating from a site where work is undertaken. Damage to adjacent properties will be to his account. The contractor is to provide cooking areas where fire risks will be minimized and controllable.		
	Potential to enhance positive impacts	Not applicable		
Comment on the overall assessment and conclusion.		With the fire prevention measures in place incident of fire can be avoided or mitigated.		
Magnitude		Low		

18.	Potential to mitigate negative impacts	**Environmental complaint register to be maintained:** • All complaints with regards to environmental non-compliance on the construction site need to be recorded and addressed accordingly. • Address complaints timorously and report back to the ECO.	The Site Manager (Contacts Manager) Will be responsible for maintaining the register and reporting any complaints received to the ECO.	During construction phase.
	Potential to enhance positive impacts	N/A		
Comment on the overall assessment and conclusion.		In order to keep trace of any compliance or non compliance acts site register is required		
Magnitude		N/A		

19.	Potential to mitigate negative impacts	**Safety and Access Control** • Safety equipment must be provided to all employees to prevent personal injury during construction activities. This includes equipment such as protective eye and ear wear and protective clothing where necessary. • Staff should be appropriately trained in all assigned activities. • Access to dangerous excavations and materials, must be controlled by the site manager. • All personnel and vehicles used for transportation and/or construction purposes should remain within these demarcated areas. • Excavations should only remain open of a minimum period of time and during this time the must be clearly demarcated so as to prevent accidental ingress of people and animals.	Contractor. Site Manager Contractor. Contractor. Contractor.	
	Potential to enhance positive impacts	Not Applicable		
Comment on the overall assessment and conclusion.		Safety and Access control will be management according to the requirement. If well managed there will be limited accident on site		
Magnitude		Low		

20.	Potential to mitigate negative impacts	**Furrows and spoil areas:** • Any spoil areas established must be rehabilitated to the satisfaction of the environmental officer. • Any spoil generated during the construction process, which cannot be re-used elsewhere should be discarded in a site identified by the Environmental Control Officer and then shaped, trimmed and re-vegetated once construction is completed. • Any excavations on site are to be backfilled as soon as possible, where appropriate. And rehabilitated with grass and indigenous trees to mimic the current vegetation	Contractor Contractor Contractor.	During construction .
	Potential to enhance positive impacts	Not applicable		
Comment on the overall assessment and conclusion.		Rehabilitation of spoiled areas should be an immediate act. An environmental practitioner should be consulted for an appropriate rehabilitation measures.		
Magnitude		Low		
21.	Potential to mitigate negative impacts	**Materials handling:** • Re-fuelling and maintenance of vehicles must take place off site. • No oils, chemicals or other hazardous materials used during construction are to be stored on site. Therefore an appropriate facility should be identified and designated for this purpose. • No construction materials should be left lying carelessly during and after construction	Contractor. Contractor.	During construction .
	Potential to enhance positive impacts	Not applicable		
Comment on the		If employees will be properly trained to handle material this could		

overall assessment and conclusion.		avoid any incidents from occurring.		
Magnitude		Low		
22.	Potential to mitigate negative impacts	**Storm water runoff:** • To prevent storm water damage, the increase in storm water run-off resulting from construction activities must be estimated and the drainage systems assessed accordingly. • Measures must be put in place to reduce the velocity of storm water before it reaches drainage • A drainage plan must be submitted to the Engineer for approval and must include the location and design criteria of any temporary stream crossing. • All storm water runoff from compacted materials must be monitored if signs of erosion become apparent. In case erosion occurs a quick remedial action should be implemented to rehabilitate the area	Contractor. Contractor. Contractor.	During construction .
	Potential to enhance positive impacts	Not applicable		
Comment on the overall assessment and conclusion.		This should be able to address soil erosion as well as the design of the substation upgrade should have appropriate storm water management as well as drainage system that should have oil trap/ filters if necessary.		
Magnitude		Low		
23.	Potential to mitigate negative impacts	**Survey Points:** • Roads or trails that are cut to provide temporary access for survey work must be minimized. • Vegetation clearing must be kept to a minimum during survey operations. • Existing boundaries should	Contractor.	During construction .

		be well pegged to avoid encroachment into neighboring properties		
	Potential to enhance positive impacts	Clear demarcation of boundaries will mitigate against boundary dispute		
Comment on the overall assessment and conclusion.		Construction will only take place within the proposed or demarcated area		
Magnitude		Low		
24.	Potential mitigate negative impacts	**Construction Camp:** • The choice of the site for the contractors' camp requires the Engineers permission and must take into account location of residents and or ecological sensitive areas, including flood zones and unstable zones. • The size of the construction camp should be kept to a minimum. • The contractor must attend to the drainage of the camp to avoid standing water and or sheet erosion.	Contractor and Engineers. Contractor. Contactor.	During construction .
	Potential to enhance positive impacts	Not applicable		
Comment on the overall assessment and conclusion.		The site will be accessible and pose less impact on the environment if chosen in a correct place. The engineers should be responsible to ensure that the chosen place has less or no environmental impact.		
Magnitude		Low		

25.	Potential to mitigate negative impacts	**Workers' Conduct on Site:** • A general regard for the social and ecological well-being of the site and adjacent areas is expected of the site staff. • Workers need to be aware of the following general rules: 1. No alcohol / drugs should be present on site. 2. No firearms are allowed on site or in vehicles transporting staff to or from the site (Unless used by the security personnel). 3. Prevent excessive noise. 4. No harvesting of firewood from the site or from the areas adjacent to it. • Other than per-approved security staff, no workers shall be permitted to live on site.	Contractor. .	During construction
	Potential to enhance positive impacts	N/A		
Comment on the overall assessment and conclusion.		Workers will be provided sufficient SHERQ awareness training		
Magnitude		N/A		
26.	Potential to mitigate negative impacts	**Ablution Facilities:** • Chemical toilets should be installed on site • All chemical toilets put on site must be serviced regularly at least once a week and a proof of servicing must be presented to the ECO	Contractor Contractor	During construction
	Potential to enhance positive impact	Not applicable		
	Comment on the overall	Ablution facilities on site will enhance hygienic conditions in and around the construction site		

	assessment and conclusion	
	Magnitude	Not applicable

8.3 Operation and maintenance phase

8.3.1. Identified impacts and proposed mitigation measures

8.3.1.1 Storm water management

In the absence of storm water management plan for the proposed site storm water may result in erosion or flood especially during heavy rainfall. It is recommended that a proper storm water drainage system be designed and implemented on site during operational phase. The storm water drainage system will assist in to preventing soil erosion on site. The contractors will be responsible to ensure that the storm water drainage system is functional and effective.

8.3.1.2 Waste generation and disposal

The solid waste generated during the operational and maintenance phase will be removed continuous and in an efficient manner to the satisfaction of the local municipality. No solid waste should be dumped on site.

8.3.1.3 Visual impacts

To reduce visual impacts it is recommended that natural indigenous vegetation be used in access roadsides and ground fillings to assist with stabilizing the roadsides and to limit soil erosion. Plants and adequate landscaping will also limit the visual impact of the development.

8.3.1.3 Clean-up action

In the event of leakage or incident occurring that leads to hazardous waste being discarded on the site, a professional company to be appointed to remove and cleanup the

waste as quickly as possible. The ECO must also carry out monthly inspections on the site during operation and maintenance phase for the waste storage site.

8.3.1.4 Environmental complaint register to be maintained

The environmental complaint register must be maintained during the operation and maintenance phase.

8.3.1.5 Maintenance of access roads

Access roads should be maintained to an acceptable surface, free of erosion and no surface water pond.

8.3.1.6 Traffic

Any traffic disruptions due to the movement of heavy machinery should be undertaken with the approval of all relevant authorities and in accordance with all relevant legislation.

No.	Impact and proposed mitigation and management actions	Responsibility	Timeframe
1.	**Storm water management:** ▪ It is recommended that proper storm water drainage system be installed to ensure that during operation and maintenance phase no further impact result due to lack of channel for storm water. ▪ Storm water should not be allowed to discharge onto bare soil but must be diverted to the existing wetland	Operator.	During operation and maintenance.
2.	**Waste generation and disposal:** ▪ Solid waste generated during operation and maintenance phase must be removed in a continuous and efficient manner to the satisfaction of the local municipality. ▪ A waste management plan to be developed and maintained for the construction site.	Operator.	During operation and maintenance.

	▪ No solid waste should be dumped on the site. ▪ All workers' waste generated on the site should be disposed of in a proper manner off site		
3.	**Clean-up action:** ▪ In the event of incident or leakage of hazardous waste from storage site, a professional company to be appointed to remove and cleanup the waste as quickly as possible.	Operator.	During construction.
4.	**Environmental complaint register to be maintained** ▪ The environmental complaint register must be maintained during the operation and maintenance phase.	Operator.	During operation and construction.
5.	**Maintenance of access roads** ▪ Access roads should be maintained to an acceptable surface free of erosion and no surface water pond	The local municipality	During operation and maintenance.
6.	**Traffic:** ▪ Any traffic disruptions due to the movement of heavy machinery should be undertaken with the approval of all relevant authorities and in accordance with all relevant legislation.	The local municipality.	During operation and maintenance.

9 Envisaged Environmental Impacts

In our opinion as the appointed Independent Environmental Consultants for the project, based on our experience with similar projects, conditions and circumstances, the proposed development will not have negative impacts on the surrounding area (bio-physical and socio-economic elements included), when properly controlled and managed

as planned. We believe that Firgrove substation extension will benefit businesses and communities in the receiving end with electricity service that is not continually interrupted (due to scheduled servicing and maintenance period), and this will create a positive social impact to the receiving communities.

10 Motivation for authorising the proposed Firgrove MTS substation upgrade and Palmiet Stikland Loop in Loop out

We would like to recommend that the proposed upgrading of Firgrove substation should be granted an Environmental Authorisation since identified impacts can be mitigated. The construction activities will take place exclusively in the demarcated area or only at the proposed preferred site (option 1). We do not foresee any further negative environmental impacts; on the contrary, y positive social impacts will be realized.

The outcome of all specialist studies conducted during the Environmental Impact Assessment and Environmental Management Plan will provide guidance for all activities to be conducted in an environmentally friendly manner during construction, operation and maintenance hence minimize negative impact to the surrounding environment. The EMP should bind the construction contractor to a high level of environmental performance and will prevent degradation of the surrounding environment.

11 Conclusion

From the outcome of all specialist studies conducted during the environmental impact assessment process alternative1 is the most suitable site for the upgrade of the Firgrove substation. Alternative 1 will create very minimal impact if mitigation measures are implemented as recommended. Overall if the expansion of the substation is approved by the competent authority it will lead to an increase in the capacity of the substation to supply electricity and consequently boost development in that vicinity.

DEFINITION OF THE TERMS IN THE ASSESSMENT

Where relevant, the following terms will be used in the assessment of the various issues and alternatives that have been identified in the scoping process.

Level of certainty
This criterion applies to the confidence of the assessor in making the assessment.

Low
The present degree of confidence in the making the assessment is lower than 40%.

Moderate :
The present degree of confidence in making the assessment is between approximately 40% and 80%.

High
The present degree of confidence in the relevant statement is greater than 80%.

IMPACT
This criterion refers to the impact in relation to its effect on a stipulated feature or environmental quality.

No impact
There will be no discernible impact on the feature under consideration.

Low
The impact on the feature under consideration will be limited in terms of its effect or duration.

Moderate
The impact on the feature is such that there will be some damage done, but the feature will not be totally destroyed or degraded, and that it will recover, or will retain a moderate amount of the relevant environmental quality concerned with it.

High
The impact on the feature is such that the damage done will be considerable and enduring. Recovery of the feature could, at best be only partial.

Very High
The impact on the feature is such that the feature will be totally destroyed and that no recovery is possible.

Unknown

The nature of the impact on the feature is not understood or cannot be predicted in any reliable fashion.

Significance
This criterion refers to the effect of the impact "in the larger scheme of things". For example, if a proposed dam will inundate a particular patch of vegetation, then the impact on that patch of vegetation is very high as it will be totally destroyed. But, if the vegetation is of a common type which has a low conservation priority, then the significance of the impact is low.

No significance
The impact is so inconsequential that it is of no significance at all.

Low
The impact is of low intensity of consequence. It is probably local in effect on a feature that is common and / or widespread.

Moderate
The impact is of sufficient intensity to warrant concern. There will be considerable disturbance / lowering of environmental quality for natural biota and / or to humans. Ecological processes will only be slightly affected. The impact will also have a moderate length of duration.

High
The impact is of considerable intensity. There will be severe degradation of the environment and localized losses of entire plant and animal assemblages may occur. Ecological processes are strongly disrupted. Social impacts may be severe. Recovery will only be possible in the long term.

Very high
The impact is of potentially devastating intensity to both the natural environment and / or to the human residents of an area. There will be total or near total failure of ecological processes. It is unlikely that mitigation is possible in any reasonable human time scale and hence the full recovery from the impact may not be possible in any reasonable human time scale. The impact may be regarded as irreversible / permanent.

Unknown: The consequences of the impact are not understood or cannot be predicted in any reliable fashion.

Levels of spatial singificance

Site level
The physical impacts of the activity being assessed will not extend beyond the immediate site. If relevant, visual impacts will only be apparent to viewers on or close to the site.

Local level
The impacts of the development may be felt or be significant at the site of the activity or within a short distance from it (defined within the context of the feature being assessed), or restricted to a narrow viewscape in the case of visual impacts.

Regional level
The impacts of the development may be felt or significant at a distance which is well – removed from the site. In the case of visual impacts, the viewscape may e increased to landscape width and breadth.

Provincial level
The impacts of the activity are sufficient so as to significant within the context of the whole province.

National level
The impacts of the activity are sufficient so as to be significant throughout the whole country.

International level
The impacts of the development are sufficient so as to be significant beyond the borders of the country.

Time periodsw

Construction Phase
The time period during which preliminary surveys and or construction and or other work is done. It will extend to the end of the construction period and includes any associated rehabilitation work and / or landscaping that may be prescribed.

Operational Phase
Operational phase is the period within which the operation of the activity continues to function. This is of particular relevance for developments which have a very large footprint, such as timber plantations or urban expansion, or opencast mines which keep expanding as they operate.

Short Term
Short term is the period of Construction and up to two years after construction. Note : This time period is defined as it is considered that it covers the period in which the footprint of the construction operation will be sustainably revegetated and wildlife will return to the disturbed areas.

Medium Term
Medium term is the period up to five years from the end of the Construction Phase. Note : This time period includes the criteria described for the Short Term, but includes the time necessary for certain processes, for example the establishment of woody vegetation, to become established on the development area.

Long Term

Long term is the period of at least ten years, possibly more, from the end of the Construction Phase or the Operational Phase. Note: This time period includes the criteria described for the Medium Term but includes the time necessary for trees to reach sufficient size to soften and screen the appearance of a low rise development.

Permanent
The change which would be brought about by the development cannot in any way be reversed *in situ.* The only mitigation options which may be available will be those which are conducted off the site.

Effects

Positive
The impact will have, on balance, predominantly beneficial effects.

Negative
The impact will have, on balance, predominantly detrimental effects.

Neutral
There will be a change, but it cannot be described as being of either a particular positive or negative nature.

Need for mitigation

Low
The need for mitigation is slight but the conditions / effects require that some effort is made.

Moderate
The need for mitigation is definite, but there is no requirement for major and / or costly works. Any proposed mitigatory measure must have good potential to reduce the impact.

High
The need for mitigation is such that major and costly works are justifiable. Any proposed mitigatory measures must have definite and demonstrable potential for reduction of the impact before the proposed development may be given authorization to proceed.

Obligatory
The nature of the impact is such that, unless mitigation can very largely nullify the consequences, it must be regarded as a potential fatal flaw which will halt the proposed development. It such mitigation cannot be achieved, it will be necessary to modify the development so that the impact will be reduced or even obviated.

Locality of mitigation

On site

The necessary mitigation must be undertaken at the site of the impact.

Off site

The necessary mitigation need not necessarily be at the site of the impact. Compensatory action may be undertaken at another, preferably similar, site on the property. For example, loss of a wetland due to construction or a dam may be mitigated by rehabilitation of a similar wetland in the vicinity.

APPENDIX SECTION

APPENDIX A:

DRAFT LAYOUT PLAN

APPENDIX B:

FACILITY ILLUSTRATION

APPENDIX C:
SPECIALIST REPORT

APPENDIX C1:
BIODIVERSITY

APPENDIX C2:

HERITAGE

APPENDIX C3:
GEOTECHNICAL

APPENDIX C7:

WETLAND STUDY

APPENDIX C8:

WASTE MANAGEMENT PLAN

APPENDIX C9:

STORM WATER MANAGEMENT PLAN

APPENDIX C 10:
SOCIAL IMPACT ASSESSMENT

APPENDIX D:

PUBLIC PARTICIPATION REPORT

APPENDIX D1:

PROOF OF ON-SITE NOTICE

APPENDIX D2:

COPIES OF WRITTEN NOTICE TO PERSONS

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MINUTES OF THE MEETING

APPENDIX D5:

ISSUES AND RESPONS REPORTS

APPENDIX D6:

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APPENDIX E:

ENVIRONMENTAL MANAGEMENT PLAN

APPENDIX F:

CORRESPONDENCE WITH DEAT

APPENDIX G:

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APPENDIX H:

COMMENTS FROM STAKEHOLDERS

APPENDIX I:

EXPERTISE OF AN EAP