A REVIEW OF THE ENVIRONMENTAL AUTHORIZATION FOLLOWED DURING THE CONSTRUCTION OF ESKOM'S KUSILE AND MEDUPI POWER STATIONS, SOUTH AFRICA

by

Emmy Molepo

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SUPERVISOR: PROF. S.J. MOJA

CO-SUPERVISOR: MS. G.M. CHADI

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DEDICATION

To my lovely kids who gave me full support and time to work and complete the study.

Glory and honor to God Almighty who gave me strength to persevere.

DECLARATION

I, Emmy Molepo hereby declare that the dissertation, which I submit for the degree Master of Environmental Sciences at the University of South Africa, is my work and has not previously been submitted by me for a degree at this or any other institution.

I declare that the dissertation does not contain any written work presented by other persons whether written, pictures, graphs or data or any other information without acknowledging the source.

I declare that where words from a written source have been used the words have been paraphrased and referenced and where exact words from a source have been used the words have been placed inside quotation marks and referenced.

I declare that I have not copied and pasted any information from the internet, without specifically acknowledging the source and have inserted appropriate references to these sources in the reference section of the dissertation.

I declare that during my study I adhered to the Research Ethics Policy of the University of South Africa, received ethics approval for the duration of my study prior to the commencement of data gathering, and have not acted outside the approval conditions.

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ABSTRACT

Environmental impact assessment follow-up has been widely addressed by various researchers. However, there is still a gap in the actual implementation of this process. This study addresses this gap by evaluating the effectiveness of implementing the environmental authorizations of Eskom's Kusile and Medupi Power Stations during the construction phase. The main aim of the study is to determine whether the environmental authorization conditions were effectively implemented by project developers and whether full compliance which could lead towards sustainable development was at the forefront of Kusile and Medupi developments.

The survey method was used whereby questionnaires were formulated and completed by fifty (50) participants involved in the implementation of both power stations' environmental authorizations. The results showed that the importance of protecting the environment and overall compliance with the projects' environmental authorization conditions are well understood and implemented. However, some of the responses indicated the difficulty in implementing certain environmental authorization conditions such as retaining existing vegetation cover. About Nineteen (19) external audit reports (of which nine were for Kusile and ten for Medupi) between the periods of 2008 to 2014 were reviewed and the audit results shown good percentage of over 90% compliance with the environmental authorization at both power stations.

In conclusion, the environmental authorizations were well implemented by both Kusile and Medupi Power Stations. The environmental management through compliance with the environmental authorization is at the forefront of the Eskom's developments and thus promotes sustainable development. The outcome of this study has a wide application that includes application to any new project that involves building infrastructure.

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ABBREVIATIONS AND ACRONYMS

ACC - Air Cooled Condenser

AEL – Atmospheric Emission License

AQM – Air Quality Monitoring

BA – Basic Assessment

DEA - Department of Environmental Affairs

DWS – Department of Water and Sanitation

EA - Environmental Authorization

EAP - Environmental Assessment Practitioner

ECA – Environment Conservation Act

ECO - Environmental Control Officer

EIA - Environmental Impact Assessment

EMC - Environmental Monitoring Committee

EMP - Environmental Management Plan

Eskom - Eskom Holdings Limited

Kusile - Kusile Power Station

Medupi - Medupi Power Station

MW - Megawatt

NEMA - National Environmental Management Act, Act No. 107 of 1998

NWA - National Water Act, Act No. 36 of 1998

SAHRA – South African Heritage Resources Agency

UNISA – University of South Africa

WUL - Water Use License

CHAPTER 1: INTRODUCTION

1.1 Introduction

This Chapter introduces the research project, presents the purpose of study, statement of the problem and the research goal. It also provides the background and description of the power station case studies used for the study.

The project aims to conduct a review of the compliance with the environmental authorization process followed during the construction of Eskom's Kusile and Medupi Power Stations in South Africa, as case studies.

Eskom Holdings Limited is a state owned company and its mandate is to generate, transmit and distribute electricity throughout South Africa (the country) and to neighbouring countries such as Mozambique, Zimbabwe and Lesotho. Eskom' head offices are located in Johannesburg, Gauteng province of the country. Eskom has several power stations across the country and among others are the newly built Kusile and Medupi Power Stations (Eskom, 2014a).

In order to meet the increasing demand of electricity in South Africa, Eskom has embarked on a new build programme to develop and construct new power stations. Some of these stations are the Ingula, Kusile and Medupi Power Stations (Eskom, 2008). The construction of these new power stations triggered different environmental licenses such as water use license (WUL) and atmospheric emission license (AEL) to be acquired prior to commencement. Among these licenses the environmental authorization (EA) was required in terms of Section 24 of National Environmental Management Act, Act No 107 of 1998. The EA is one of the permits or license issued following the process of the environmental impact assessment (EIA) or basic assessment (BA) on a project.

Wood (2003) explains the EIA as an anticipatory, participatory, integrative environmental management tool that has the objective of providing authorities with an indication of the likely consequences of their decisions relating to new developments. Wood (2003) further explains EIA as the tool to evaluate the possible effects likely to arise from a development which will significantly affect the natural and man-made environment,

The EIA process in South Africa (SA) is regulated by the National Environmental Management Act 107 (NEMA, 1998) and the custodian of the act is the Department of Environmental Affairs (DEA). NEMA has set out the EIA regulations, 2014 as amended, which has three listing notices listing the activities that require basic assessment or scoping and EIA process to be undertaken and the license which is the environmental authorization (EA) is issued by DEA prior to commencement of such activities.

According to the researcher, a project triggering an EIA may only commence once the EIA process has been undertaken, completed and the EA has been issued. However, like any other license, the EA comes with conditions that the project has to comply with. Therefore, this research focuses on how effective are the EA conditions implemented and complied with during the construction phases of both Eskom' Kusile and Medupi Power Stations.

The DEA have a compliance directorate that conducts audits in a form of compliance inspections to projects with issued EA. This can be seen as EIA follow-up by authority (DEA).

1.2 Power stations background

1.2.1 Kusile Power Station case study

Kusile Power Station (Kusile) is located in Delmas Local Municipality within Nkangala District Municipality of Mpumalanga Province in South Africa outside Emalahleni town commonly known as Witbank, as shown in Figure 1.1. According to Eskom (2014a), Kusile is a coal-fired power station with a site of about 1 355 hectares (ha) in size, and is located on the farm Hartbeesfontein 537 JR and farm Klipfontein566 JR. Kusile is the most advanced coal-fired power plant project in Eskom after Medupi Power Station in Lephalale where construction activities are currently underway and began in 2000 (Eskom, 2014a).

The EIA for Kusile was conducted between 2005 and 2007 (Ninham Shand Consulting Services, 2007). Its EIA followed just after the Medupi Power Station EIA (Senior Environmental Corporate Specialist, 2014). The EA was first issued on 05 June 2007 and amended EA was issued after the review of two appeals on 17 March 2008 by DEA, see attached Appendix I.

During the EIA phase the project had no specific name and was referred to as the Eskom Generation proposed 5400MW coal fired power station, Witbank Project Bravo (Van Schalkwyk, 2008). The name Kusile was only used after the EA was issued. The project area is within a riverine wetland, as indicated in Figure 1.2.

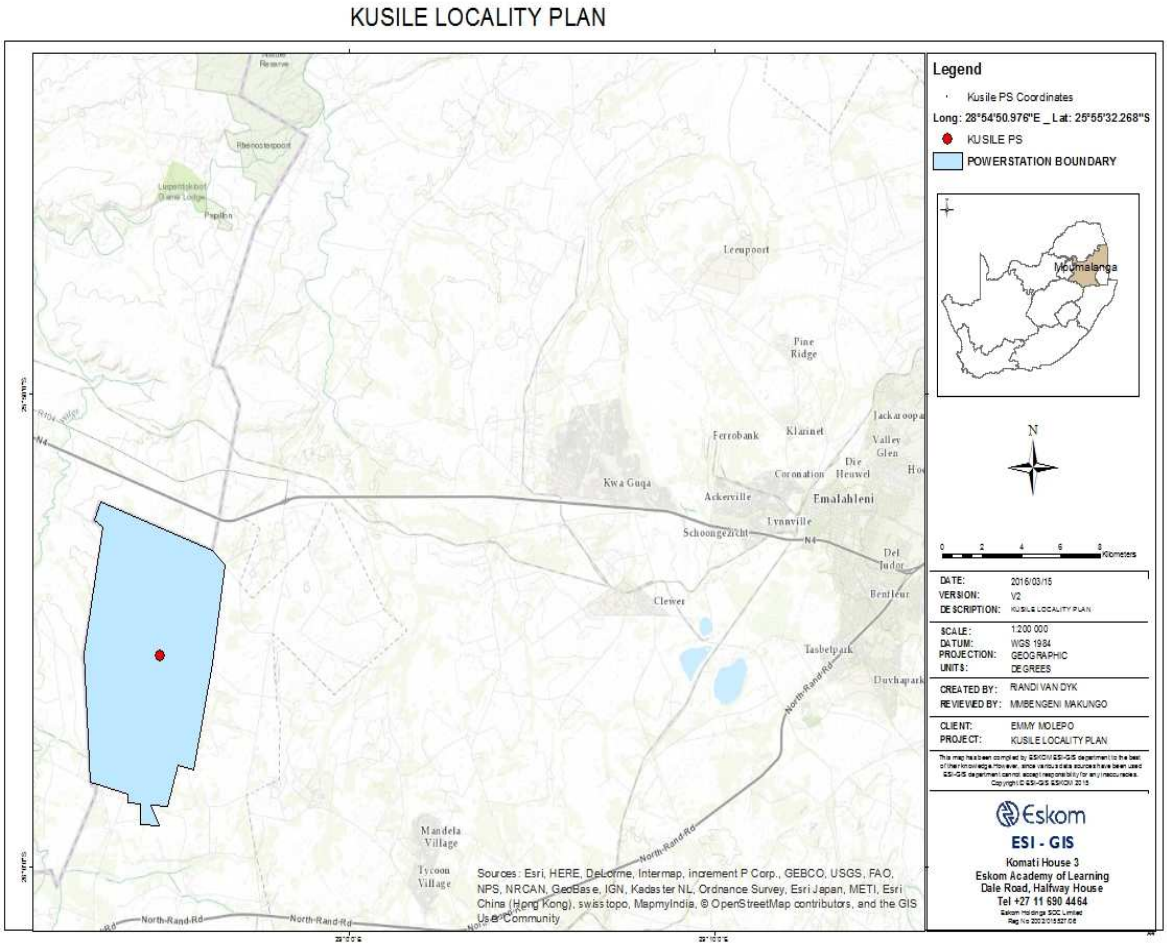


Figure 1.1 Kusile Power Station locality map (Van Dyk, 2016)

According to Eskom (2014a), a coal-fired power station takes about ten years to build. Kusile construction started in April 2008 and marking its seventh year of construction in 2015. This research study will focus on the main Kusile EA compliance for the past seven years till end April 2015 and not the whole 10 years of power station construction. The station will consist of six units each rated at approximately 800 MW installed capacity giving a total of 4800 MW. As such it will be one of the largest coal-fired power stations in the world, once finished.

Kusile EA was first issued on 05 June 2007 (Yako, 2007) and amended EA was issued after the review of two appeals on 17 March 2008 by the National Department of Environmental Affairs (Van Schalkwyk, 2008).

The project description of the activities as on the Kusile EA, (attached in Appendix I (Yako, 2007; Van Schalkwyk, 2008):

- The construction of a 5400MW coal fired power station and ancillary uses near Witbank, on approximately 2500ha of the farm Hartbeestfontein 537 JR and farm Klipfontein 566 JR.
- The proposed project consist of the establishment of the following components:
    - Power station precinct (area)
        - Power station buildings;
        - Administrative buildings (control buildings, medical, security, etc); and
        - High voltage yard (electricity substation).
- Associated infrastructure:
    - Coal stock yard;
    - Coal and ash conveyors;
    - Water supply pipelines (temporary and permanent);
    - Water and wastewater treatment facilities;
    - Ash disposal system;
    - Access roads (including haul roads)
    - Dams for water storage; and
    - Railway siding and/or line for sorbent supply.

Kusile EA was issued in terms of Section 21 and 22 of the Environment Conservation Act (ECA), Act No 73 of 1989 and regulation of Government Notice R 1182 of 1997. The authorised activities are shown in Table 1.1.

Table 1.1- Kusile authorised listed activities in terms of EIA Regulation R1182 of 1997 (Van Schalkwyk, 2008)

Listed Activity	Authorised activities description in terms of EIA Regulation R 1182 of 1997
Item 1	The construction, erection or upgrading of: Item 1(a). facilities for commercial electricity generation with an output of at least 10 megawatts and infrastructure for bulk supply; Item 1(c). with regard to any substance which is dangerous or hazardous and is controlled by national legislation: ▪ infrastructure, excluding road and rails, for the transportation of any substances; and ▪ manufacturing, storage, handling, treatment or processing facilities for any such substance; Item 1(d). roads, railways, airfield and associated structures; Item 1(g).structures associated with communication networks, including masts, towers and reflector dishes Item 1(i).schemes for the abstraction or utilisation of ground or surface water for bulk supply purpose; Item 1(n).sewage treatment plants and associated infrastructure
Item 2	The change of land use from Item 2(c). agriculture or zoned undetermined use or equivalent zoning to any other land use
Item 8	The disposal of waste as defined in Section 20 of the Act (ECA), excluding domestic waste, but including the establishment, expansion, upgrading or closure of facilities for all waste, ashes and building rubble.

Figure 1.2 Diverted riverine wetland within Kusile construction site

1.2.2 Medupi Power Station case study

Medupi Power Station (Medupi) is located in Waterberg District Municipality of Limpopo Province in South Africa outside Lephalale town near Maropong community, as indicated in Figure 1.3. According to Eskom (2014a) as a result of the increasing demand for electricity in South Africa, Eskom decided to increase its electricity generating capacity. Eskom decided to build a new coal-fired power station, named Medupi near Lephalale, consisting of six super critical boilers and 6 turbine generator units with air-cooled condensers. Medupi have a nominal generating capacity of 4800 MW. On completion Medupi Power Station will be the largest dry cooled power station in the world (Eskom, 2014a).

Medupi is the first Eskom coal-fired power station whereby an EIA was conducted since the EIA regulations was first promulgated in South Africa in 1997 in terms of the EIA Regulations 1182 as set under Environment Conservation Act, Act No. 73 of 1989. All the Eskom previous or old power stations were constructed before then hence the EIA was not conducted. From Medupi followed the Kusile and Ingula Power Stations where the EIA was also conducted (Senior Environmental Corporate Specialist, 2014).

The Medupi EIA was conducted between 2003 and 2006 (Bohlweki Environmental Consulting, 2006). The EA was issued by DEA on 21 September 2006, see attached Appendix II. During the EIA phase the project had no specific name and was referred to as the proposed Eskom Holdings Limited Generation division 4800MW coal fired power station (Yako, 2006). Medupi was only named after the EA was issued.

Medupi EA was issued on 21 September 2006 by DEA. The project construction, as indicated in Figure 1.4, commenced in early 2007 and is currently underway with the first unit been operational since March 2015 (Senior Environmental Advisor, 2015). The research focus area like Kusile will be on Medupi EA compliance of the past eight years till end April 2015.

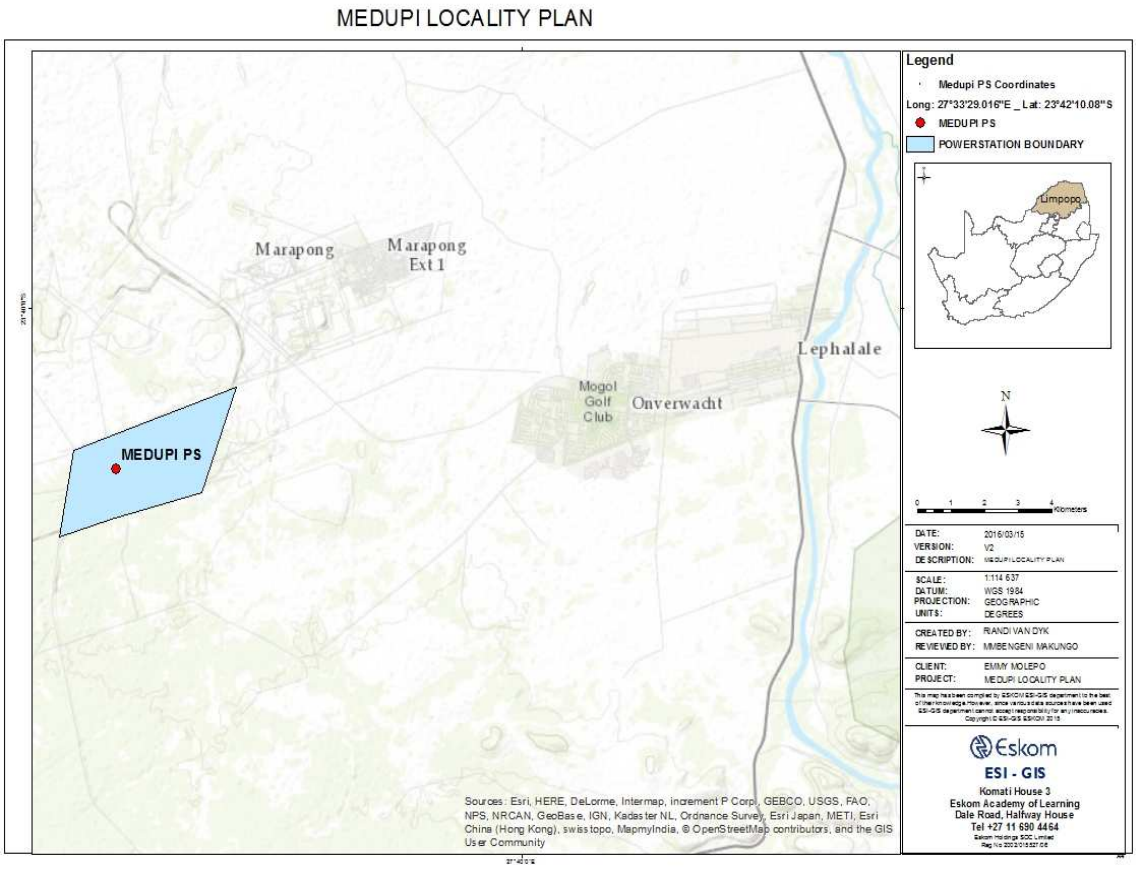


Figure 1.3 Medupi Power Station locality map (Van Dyk, 2016)

The project description of the activities as on the Medupi EA, attached in Appendix II (Yako, 2006):

- The construction of a 4800MW coal fired power station near Lephalale, on approximately 700ha of the farm Naauwontkomen 509 LQ;
- The installation of ancillary infrastructure including the ashing facility on 500-1000ha of the farm Eenzaanmheid 687 LQ;
- The construction on a conveyor belt for coal supply on the eastern alignment;
- The re-routing of the Steenbokpan Road to the northern alternative; and
- The construction of the overland ash conveyor belt.

Medupi EA was issued in terms of Section 21, 22, 26 and 28 of the Environment Conservation Act (ECA), Act No 73 of 1989 and regulation of Government Notice R 1182 and R 1183 (as amended) of 1997. The authorised activities are indicated in Table 1.2 below.

Figure 1.4 Medupi Power Station construction site

Table 1.2 - Medupi authorised listed activities in terms of EIA Regulation R1182 and R1183 of 1997 (Yako, 2006)

Listed Activity	Authorised activities description in terms of EIA Regulation R1182 and R 1183 of 1997
Item 1	The construction, erection or upgrading of: Item 1(a). facilities for commercial electricity generation with an output of at least 10 megawatts and infrastructure for bulk supply; Item 1(c). with regard to any substance which is dangerous or hazardous and is controlled by national legislation: ▪ infrastructure, excluding road and rails, for the transportation of any substances; and ▪ manufacturing, storage, handling, treatment or processing facilities for any such substance; Item 1(d). roads, railways, airfield and associated structures; and Item 1(n). sewage treatment plants and associated infrastructure.
Item 2	The change of land use from Item 2(c). agriculture or zoned undetermined use or equivalent zoning to any other land use
Item 9	Scheduled processes listed in the Second Schedule to the Atmospheric Pollution Prevention Act (APPA), Act No 45 of 1965. Process 29(a) – Power generation processes in which fuel is burned for the generation of electricity for distribution to the public or for purposes of public transport.

1.3 Statement of the problem

Environmental authorizations are issued to project developments to ensure that environmental impacts as identified during the EIA process are avoided and/or minimized at both project construction and operational phases. The EA sets out conditions which the developer has to comply with to protect the environment and promote sustainable development as it states in terms of Section 24 of National Environmental Management Act (NEMA), Act No 107 of 1998. EIA is required in terms of EIA regulations, GN R 982 of 2014 as sets out by NEMA, 1998 as amended.

According to Arts *et al.* (2001), there are uncertainties in knowing whether some additional actions are needed to prevent unacceptable environmental impacts. These uncertainties result in the need for follow-up to EIA in order to verify the real effects of the project. Furthermore Youthed (2009) explains that one of the advantages of conducting EIA follow-up is because it allows learning from experiences to take place.

The problem statement of this research study is based on uncertainties associated with post EIA activities during the construction phase. That is:

- How the compliance and implementation of the EA conditions effectiveness during construction phase is.
- Whether the EA conditions help to minimize the development' impacts on the environment.

In order to answer these research questions, two cases studies are used which are Eskom Kusile and Medupi Power stations. These two case studies were among the mega projects in South Africa for the generation of electricity and currently in their construction phases.

1.4 Purpose of the study

According to Arts *et al.* (2001), an EIA follow-up is primarily concerned with the post-decision activities of a project once decision has been taken. It indicates the consequences of an activity as they occur as it is not necessarily the predicted effects (during EIA phase) but the real practical effects that are relevant to the environment. EIA follow-up can be seen as the missing link or implementation gap between EIA and project implementation, as also indicated in Figure 2.1 in Chapter 2 of this report.

Cubitt (2001, p.80) study revealed that "although EIA is a highly integrated environmental management tool, its full value is reduced if there are no follow-up measures succeeding each". Most EIAs are carried out as usual, where recommendations for reducing the detrimental environmental impacts are made and also incorporated into an Environmental Management Plan (EMP). However,

there is no monitoring or auditing procedures set in place to ensure that the conditions of approval of the EIA and the EMP are enforced (Cubitt, 2001).

The purpose of this research study is to evaluate the effectiveness of implementing the EA conditions during construction phases of the two identified case studies, Kusile and Medupi Power Stations. This would be by identifying challenges encountered during the EA implementation related to environmental management.

This research study is slightly similar to EIA follow-up. The study looks at the consequences of the EA conditions implementation on the environment (i.e. the practical effects that are relevant to the environment) and how well monitoring is conducted as there are structured monitoring and audits at these two power stations.

The study mainly determines the effectiveness of implementing and complying with the EA conditions during construction phase. Whereas EIA follow-up monitors and evaluates the impacts of a project that was subjected to EIA for the purpose of managing and communicating the environmental performance of such a project (Morrison-Saunders *et al*., 2007).

1.5 Research aim

The main research aim was to determine whether EA conditions were effectively implemented during construction phases in order to ensure that sustainable development is at the forefront of Kusile and Medupi Power Station developments. The study further evaluates the environmental damage as predicted or identified during the EIA phase of these project developments.

The following therefore highlights the main research objectives:

- To determine the effectiveness of implementing and complying with the EA conditions during project construction phase;
- To identify the project challenges for implementing and complying with the EA conditions; and
- To determine whether the EA conditions if well implemented, protect and minimize or avoid the development's negative impact on the environment. If

not well implemented, to determine whether the environment is being negatively damaged.

1.6 Report writing

The writing of the research report rounds off the research project. The main questions for a research report to answer should be, what was the research problem; how was the problem investigated; what was found; and what are the implications and the meaning of the findings towards the research problem (Welman and Kruger, 1999).

The structure of this research report is as follows, as described by Mouton (2009), as cited by UNISA (2015 p 17):

- Chapter 1: Introduction
- Chapter 2: Literature review
- Chapter 3: Research design and methodology
- Chapter 4: Results and discussion
- Chapter 5: Conclusions and recommendations

The purpose of this Chapter was to introduce the research study as well as what the research aims are. The research case studies used are Eskom's Kusile and Medupi Power Stations. The next Chapter will look at the literature related to the topic of the study.

CHAPTER 2: LITERATURE REVIEW

This Chapter records the literature review regarding the EIA and how the EA is birthed as a result of the EIA process. It also describes the state of the environment within the case studies area and shows what EIA follow-up is and its importance as discussed by different authors.

2.1 State of the environment

The environment as defined by NEMA (1998) is the "*surroundings within which humans exist and that are made up of the land, water and atmosphere of the earth; micro-organisms, plant and animal life; any part or combination of and the interrelationships among and between them; and the physical, chemical and aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being*".

These environmental aspects; land, water, air, plants and animals species need to be protected from negative impacts of human interaction or their interrelationships or combination thereof. Hence the need for environmental management is crucial for project activities. Environmental management is therefore, a systematic way of finding solutions to problems human beings face in cohabitation with nature, resource exploitation and waste production (National Environment Commission, 2011).

The Rio declaration (1992) proclaimed twenty-seven (27) environmental management principles. Principle 21 proclaims the sustainable development to ensure the better future for all. In South Africa, Section 2 of NEMA (1998) set out the environmental management principles adapted from the international agreements. The principles among others require the following:

- Developments should be socially, economically and environmentally sustainable;
- Pollution and degradation should be avoided, minimized and/or remedied;
- Disturbance to the nation' cultural heritage areas should be avoided, minimized and/or remedied;
- Waste should be avoided and where it cannot be avoided it should be minimized, reduced, recycled and/or disposed of in a responsible manner;

- Detrimental impacts on the environment and people' environmental rights should be anticipated and prevented and/or minimized;
- Environmental management should be integrated as all environmental aspects are linked and interrelated;
- Environmental decisions should consider the interests, needs and values of all interested and affected parties and undertaken in an open and transparent manner; and
- The cost of remedying pollution or environmental degradation should be paid by those who caused such pollution, etc.

South Africa participated in the United Nations Commission for Sustainable Development in 1997, since its participation South Africa records the status of the environment through the state of the environmental reports (Mpumalanga Province, 2003).

According to Mpumalanga Province (2003), environmental issues faced within the study area of Kusile are the following:

- Poverty and vulnerability;
- Air quality;
- Biodiversity;
- Waste management;
- Land degradation;
- Water; and
- Environmental management and governance.

Whereas Medupi study area is faced with the following environmental issues or pressures (LEDET, 2004):

- Water;
- Biodiversity;
- Physical and scenic features;
- Heritage resources;
- Health and welfare; and
- Population.

These environmental issues need to be dealt with. The common issues for both the case studies are water and biodiversity. Generally, South Africa' freshwater is scarce,

limited and unreasonable available both in time, demand and space. The quantity availability of the water is relative to the water quality.

In South Africa this water is mostly from three (3) sources; the surface water (dams and rivers); return flows (sewage and effluent purifications); and groundwater (Water Research Commission, 2009). The National Business Initiative (2014) further describes these sources of water withdrawals, indicated in Figure 2.1 and destinations of the water discharges, as indicated in Figure 2.2 below. From these pie charts, it is evident that more water about 52% is drawn from surface water but very little about 16% is returned back to those surface water systems.

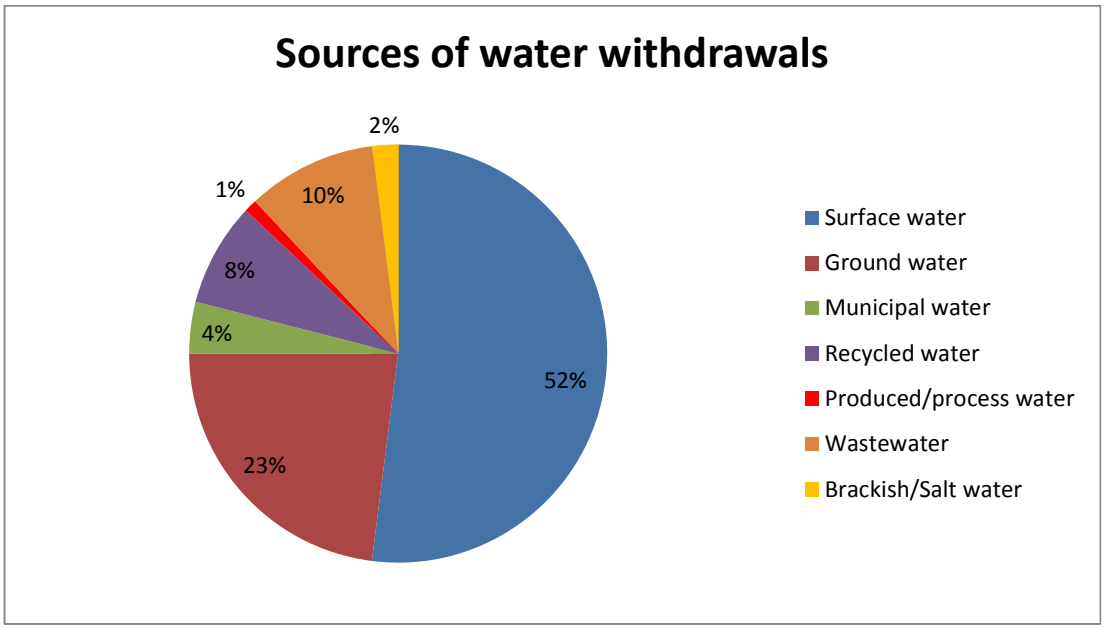


Figure 2.1 Sources of water withdrawals in South Africa (National Business Initiative, 2014)

Water Research Commission (2009) describes the potential major pollution sources of these water resources from uncontrolled sewages, poorly managed wastewater treatment plants, dumping in old mines, petroleum spills, and agricultural chemicals that seep into the ground. It therefore, makes sense to protect the water resources.

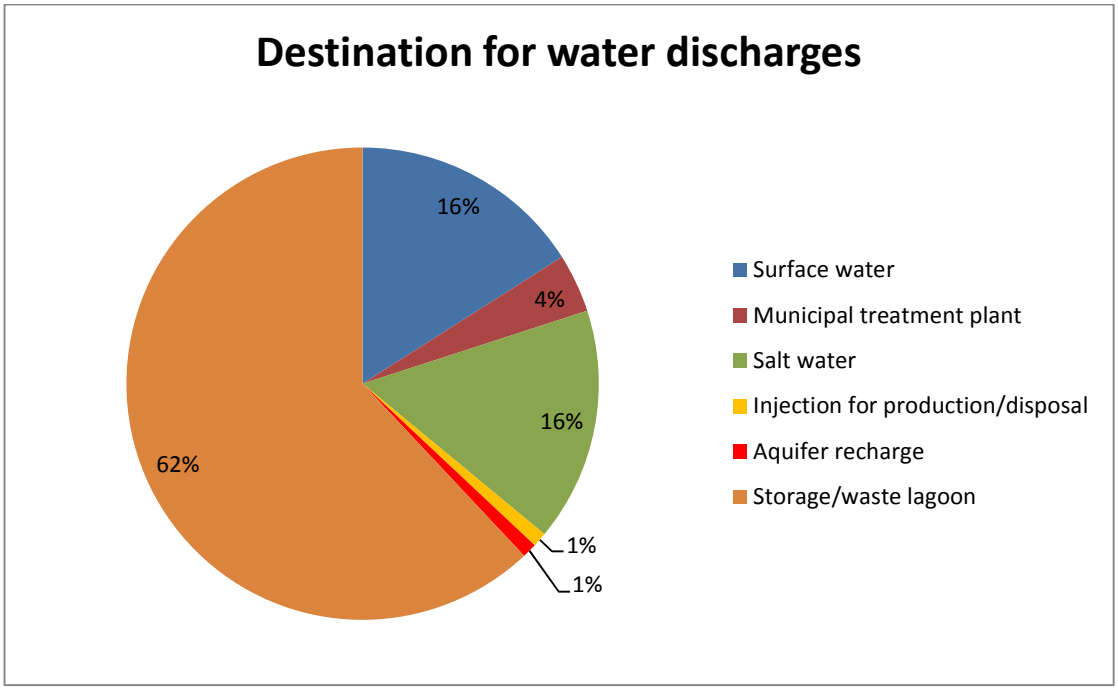


Figure 2.2 Destinations of the water discharges in South Africa (National Business Initiative, 2014)

For protecting the water resources, the World Business Council for Sustainable Development, as cited by Water Research Commission (2009, P 33) requires industries and businesses to undertake the following in order to alleviate the pressure on the water resources:

- Measure and monitor water use;
- Reduce water consumption by means of recycling or reusing water; and
- Engage in partnerships with municipalities, non-governmental organizations and scientific groups in order to improve the understanding and management of the water resource.

Another water management is the water pricing strategy which was published for comments in November 2015 by the Department of Water and Sanitation. The water pricing strategy provides the framework for pricing the use and discharge of water from or to the water resources. Its main objective is to ensure that water is efficiently and effectively managed for equitable and sustainable growth and development.

The other common environmental issue as discussed above other than the water is the biodiversity. Biodiversity is a combination of variety of living organisms in all ecosystems on earth. South Africa covers an area of about 122 million hectares and

this represents 2% of the world' land surface (Department of Environmental Affairs, 2016). Of its 2% world coverage, it is the world home to 7.8% of plants, 5.8% of mammals, 8% of birds, 4.6% reptiles and 5.5% of insects, as indicated in Figure 2.3 (Department of Environmental Affairs, 2016). This makes South Africa a biodiversity rich country and adequate management becomes crucial to avoid extinction of certain species. It thus regulates its biodiversity through the National Environmental Management: Biodiversity Act No 10 of 2004 which provides a framework to protect valuable species, ecosystem and its biological wealth.

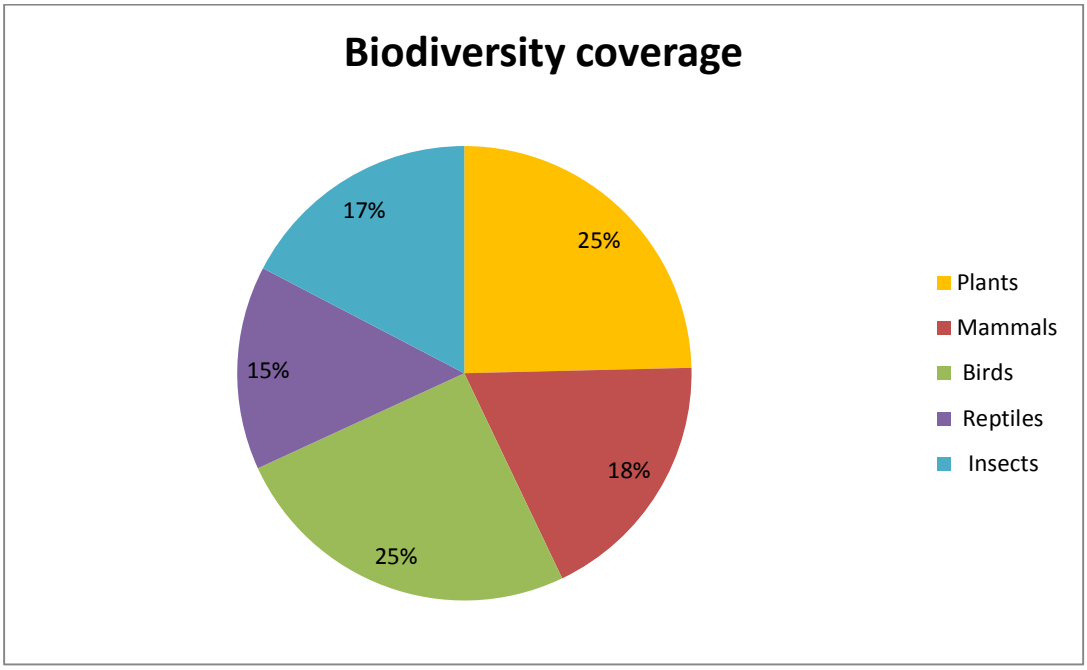


Figure 2.3 South Africa' world biodiversity coverage (Department of Environmental Affairs, 2016).

2.2 What is EIA and its origin?

EIA is the process of evaluating the potential impacts likely to arise from a proposed project that could affect both the natural (all environmental aspects including the socio-economic) and man-made environment (Wood, 2003). This evaluation includes consultation and participation and it is a systematic and integrative process (Wood, 2003). Furthermore, the EIA can assist to identify these potential impacts at an early stage, and can result in improving the planning and design of the development

(Department of the Environment, Transport and the Regions (1999b) as citied by Wood (2003, p 1).

Woods (2003) emphasises that EIA is not a procedure for preventing actions with significant environmental impacts from being implemented, rather it is to ensure that decision is made in the full knowledge of the project' environmental impacts.

The EIA requirement and procedure was first developed in the United States in 1970 as a result of the National Environmental Policy Act (NEPA), 1969 (Tarr, 2003). This was for considering possible impacts prior to a decision being taken on whether or not a proposal should be given approval to proceed (Wood, 2003). California was the first of the American states to introduce an effective "little NEPA" in 1970 (Bass *et al*. (1999) as citied by Wood (2003, p 4).

EIA is recognised as a key support tool for sustainable development. For EIA to effectively contribute to sustainable development, it needs to show that it can contribute to poverty alleviation, employment creation and improved economic development (Tarr, 2003). Thus making the EA to ensure that developments promote sustainable development, as the process of EIA is conducted to acquire EA or licenses for developments.

2.3 South African legislation on EIA

The Constitution of the Republic of South Africa (RSA) Act No 108 of 1996, Section 24 states that "*Everyone has the right to an environment that is not harmful to their health or well-being; and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:*

- *prevent pollution and ecological degradation;*
- *promote conservation; and*
- *secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development*", Constitution RSA (1996).

This supreme law governs all other law in South Africa, and clearly identifies the need to strive towards environmental excellence, by developing environmental management

tools such as EIA's to control certain human activities which may have detrimental effects on the environment (Jordaan, 2010, p 29).

The EIA process in South Africa is currently regulated by the National Environmental Management Act No 107 of 1998, NEMA 1998. The custodian of the act is the Department of Environmental Affairs (DEA). National Environmental Management Act (NEMA) was promulgated to meet and align with the requirements of Section 24 of the constitution mentioned above. NEMA main purpose is to provide for co-operative, environmental governance by establishing principles for decision-making on matters affecting the environment, NEMA (1998).

However, the EIA Regulations was first promulgated in 1997 in terms of Environment Conservation Act No 73 of 1989, ECA 1989 in schedule 1 GN R 1182. Thereafter amended to be set out in terms of NEMA in 2006, 2010 and now recently amended to 2014 regulations, EIA Regulations 2014.

The 2014 EIA Regulations has 3 listing notices as follows, (EIA Regulations, 2014):

- EIA regulations – R982
    - Listing notice 1 – R983
    - Listing notice 2 – R984
    - Listing notice 3 – R985

Listed activities in terms of Government Notice (GN) R983 and GN R 985 of the 2014 EIA Regulations, as amended undergo the process of basic assessment (BA) whereas listed activities in terms of GN R984 of the EIA Regulations undergo the Scoping and Environmental Impact Reporting (S&EIR) Process (EIA Regulations, 2014).

Both these two processes (BA and S&EIR) are for the purpose of acquiring an environmental authorization (previously called Record of Decision) in terms of the 2014 EIA Regulations prior to activity or project execution. The conditions to the EA differ from project to project however the aim is to avoid and/or minimize the project detrimental impacts identified during BA/S&EIR (EIA phases) on the environment towards promoting sustainable development as explained by (Tarr, 2003; Wood 2003) in paragraphs above.

EIA is one of the tools, which may facilitate the sustainable development of a state (Jelena *et. al*., 2012, p 191). Sustainable development is the development that meets

the needs of the present without compromising the ability of future generations to meet their own needs (Brundtland, 1987). Generally this has to do with finding a balance between economy, environment and social aspects.

It therefore has to be noted that a development cannot have EA conditions expected to be implemented without undergone the EIA process. Therefore, the discussion of EA cannot be isolated from the EIA. As Jelena *et al* (2012, p 191) explains above, it means that if EIA facilitates sustainable development, then the EA compliance can also promote the sustainable development as well.

2.4 What is EIA follow-up?

EIA follow-up can be defined as the monitoring and evaluation of the impacts of a project or plan (that has been subject to EIA) for management of, and communication about, the environmental performance of that project or plan (Morrison-Saunders and Arts, 2004b) as cited by Marshall *et al.* (2005, p 176). EIA follow-up comprises of four elements namely; monitoring, evaluation, management and communication.

Arts *et al* (2001); Morrison-Saunders and Arts (2004b) as cited by Marshall et al. (2005, p 176) explains these four elements as follow:

- **Monitoring** – the collection of data and its comparison with standards, predictions and/or expectations. It includes baseline monitoring of the initial state of the environment, compliance monitoring and the effects or impacts of decision (EA) in the post-decision stage or construction phase.

- **Evaluation** – the assessment of the compliance with standards, predications and/ or expectations and the environmental performance of the activity or development.

- **Management** – making decisions and taking appropriate actions in response to findings raised during the monitoring and evaluation stages.

- **Communication** – providing feedback on the results of the development' implementation and status of the EIA follow-up to stakeholders. Stakeholders

include the development applicant, authorities and interested and affected parties.

For this study purpose, the focus is on the compliance of the EA which is the first and second elements, monitoring and evaluation, of the EIA follow-up. Reasons had been that the findings of this study will not be managed by the researcher rather it requires the power stations owners for management of such findings. Similar to communication element, which is to provide feedback on the project implementation, compliance and EIA processes (Morrison-Saunders and Arts 2004b) as cited by Marshall et al. (2005, p 176). It requires the involvement of power stations owners and authorities.

Arts *et al.* (2001) as cited by Marshall *et al.* (2005, p 177) state that EIA follow-up links the pre and post decision stages of EIA, thereby bridging the implementation gap, as indicated in Figure 2.4, that arises when there is a considerable difference between projects plans and their implementation'.

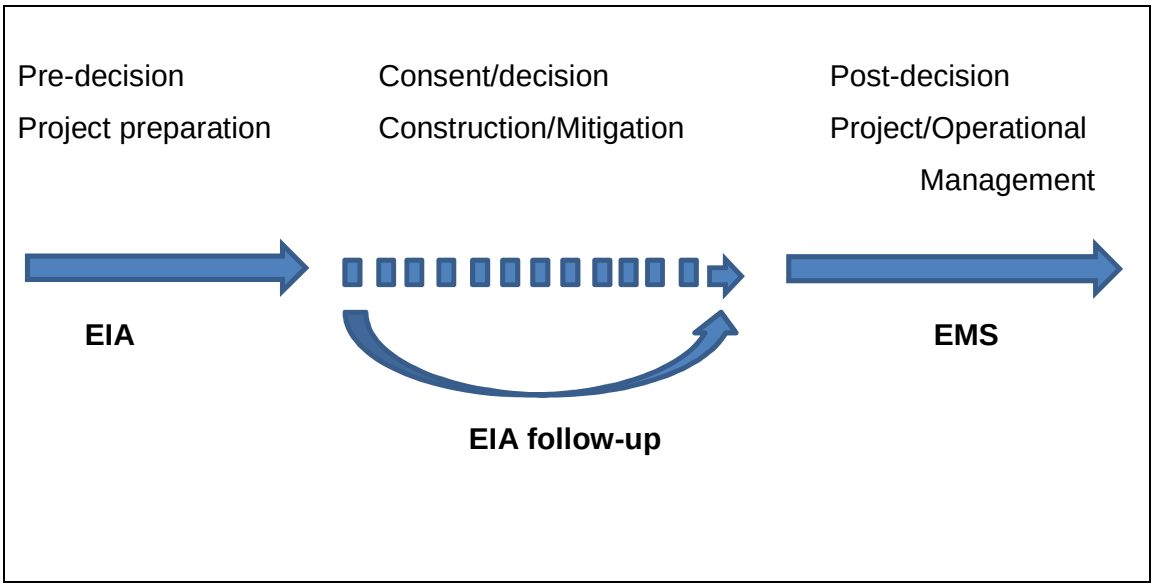


Figure 2.4 EIA follow-up bridging the implementation gap

Source: Marshall (2004), as cited by Marshall *et al.* (2005, P178)

2.5 Why EIA follow-up?

The rationale of EIA follow-up seems to be similar to that of EIA itself, getting a grip on uncertainties intrinsic to a prospective activity, such as project planning and decision making. Although a through pre-decision analysis such as EIA is a necessary pre-requisite, it is not a sufficient condition for sound or sustainable planning, decision making and management of projects. There will always be uncertainties and gaps in knowledge (Arts *et al.,* 2001). Follow-up can address such uncertainties and deficiencies, which are intrinsic to EIA planning and decision making processes, thereby rationalising these processes (Marshall *et al.,* 2005).

The core of the EIA follow-up activities is to assess the foreseen and even the unforeseen geo-environmental impacts and to evaluate the effectiveness of mitigation measures applied to reduce their magnitude (Amarilis *et al.,* 2015).

This calls for an EIA follow-up as according to Arts *et al.* (2001), there may be a considerable difference between project plans and their implementation (their occurring environmental consequences). There is a prevailing recognition of the importance of, and the need for some form of follow-up to EIA activities (Arts *et al.,* 2001).

According to Marshall *et al.* (2005), ultimately follow-up is essential in determining the outcomes of EIA. By incorporating feedback into the EIA process, follow-up enables learning from experience to occur. Feedback from follow-up programmes can also facilitate learning about pre-decision EIA activities (such as the accuracy of impact prediction methods). This knowledge can be used by regulators and proponents alike to improve future EIAs.

Morrison-Saunders and Arts (2004b) as cited by Marshall *et al*. (2005, p 177) explains levels of EIA follow-up application as the following:

- **Monitoring and evaluation of EIA activities (Micro scale)**

This is conducted on a project-by-project basis and relates directly to specific EIA developments. Its key question is "*Was the project and the impacted environment managed in an acceptable way?*"

- **Evaluation of EIA system (Macro-scale)**

This is conducted for EIA in a certain jurisdiction to examine its effectiveness. Its key question is "*How efficient and effective is a given EIA system overall?*"

- **Evaluation of the utility of EIA (meta-scale)**

This level is closely related to the macro-scale level and further determines whether the EIA is a worthwhile exercise. Its key question is "*Does EIA work?*"

This study is at the micro-scale level of the EIA follow-up as it aims to determine compliance of the EA on the Kusile and Medupi Power Stations. That is how the power stations construction phases impacts are managed on the environment and whether the EA is implemented and complied with adequately.

2.6 EA conditions

For a development to have an EA it should have undergone the EIA process whereby the EA will be issued by the authorities to the developer. Only then can the EA be implemented.

As discussed in the purpose of study in Chapter 1 earlier on, this research is slightly similar to EIA follow-up however it considers only the first two elements of EIA follow-up (monitoring and evaluation). It thus looks at the consequences of the project implementation on the environment (the practical effects that are relevant to the environment) and how well monitoring is conducted. It aims to determine the effectiveness of implementing and complying with the EA conditions during construction phase of a development. It also determines whether the EA compliance of these case studies promote sustainable development.

Undertaking the monitoring compliance of the EA project requires the need to monitor the difference between defaults and impacts (Youthed, 2009). The work undertaken by Youthed (2009) for the EA compliance and follow-up study of several projects in the Eastern Cape, South Africa, found that default which is a precise check of compliance or non-compliance to EA condition is essential in monitoring EA compliance.

Youthed (2009) further showed that the compliance would not always be a yes for full compliance, rather it may be no for non-compliance, partial compliance and not

applicable conditions. This was also the compliance categories used by Bailey and Hobbs (1990), as cited by Youthed (2009, p 80). This study also indicated conditions that were defaulted and impacts as well as categorising the EA compliance status from full compliance, non-compliance, partial to not applicable conditions.

The EA has conditions, by which default is measured, that the project has to comply with in order to reduce the impacts of such project on the environment. There is therefore the anticipated relationship between defaults of EA conditions and impacts that could occur (Youthed, 2009). However, Youthed (2009, p 86) is of the opinion that the full compliance or increased compliance does not guarantee full environmental protection.

One of the implementation methods that assist good compliance with the EA condition is the development of the method statements for activities within a project. This was one of the findings from Bataineh (2007), who investigated the effectiveness of the EIA adopted in the construction of the Baku-Teblish-Ceyhan oil pipeline in Azerbaijan, Europe. Both the power stations in this study developed the method statements to provide further direction in compliance with the required conditions. These method statements among other things include the management of waste, water, vegetation and hazardous handling. According to the researcher, developing of method statements contribute positively towards implementation of the EA conditions.

Welford (1994) who conducted a study for improving corporate environmental performance further showed that environmental monitoring or auditing is the good step towards improving environmental protection. It also provides assurance that legislation is being adhered to, which results into prevention of fines or litigation and improves public image of the project or development.

EIA effectiveness could be achieved by undertaking tailored methods learnt from international experiences (Zhang *et al*., 2012). Amarilis *et al*., (2015), concluded in the study that recognising, understanding the behaviour and limitation of the mitigation measures as well as detailing their applicability to a specific construction site is key to ensuring effective implementation of the EIA follow-up. In this study the drafting of EA conditions showed some level of authorities' understanding of the project construction activities. However, some crucial aspects were not addressed such as the wetland, noise and biodiversity management".

The researcher agrees with Zhang *et al*., (2012) and Amarilis *et al*., (2015)' findings. It is the researcher' view that without understanding the project site and different issues involved by the entire project' role players, the EA conditions implementation would not fully be a success. Therefore, after the mitigation measures have being tailored to a specific project, it should be work-shopped to all project role players to determine the level of applicability. That way the effective implementation of the EA conditions could be guaranteed.

The purpose of this Chapter was to discuss the literature in relation to the research study topic of complying with the EA conditions at a project construction phase. It was noted that the EIA follow-up is comprised of four elements namely; monitoring, evaluation, management and communication. This study' focus is on the first two elements, monitoring and evaluation. Monitoring compliance of the EA project requires the need to monitor the difference between defaults and impacts. The next Chapter discusses the methodology used in this report.

CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

This Chapter describes the research design and methodology used in addressing the research problem as identified in Chapter 1 of this report and describes the study area as well. The study is reviewing the effectiveness of EA compliance for both Eskom' Kusile and Medupi Power Stations.

The research methodology used in this research study is the mixed method and research design is the survey method. This Chapter further describes how data was collected and analysed.

3.1 Study Area

This study used two case studies located in two provinces on the northern part of South Africa (the country). Kusile is situated in the Mpumalanga Province while Medupi in the Limpopo Province.

3.1.1 Kusile study area

Mpumalanga Province is located towards north-east of South Africa, as indicated on the legend on Figure 1.1 in Chapter 1. Its name is nguni language meaning "the place of the rising sun". The capital city of this province is Nelspruit. It further has many towns among them are Emalahleni (formerly known as Witbank), Middelburg, Groblersdal, Ermelo, Bethal, Standerton, etc (Mpumalanga Province Government, 2012).

The province also has many district municipalities among them are Nkangala, Gert Sibande, Ehlanzeni, etc. Each district municipality has its own local municipalities. Kusile is situated about 47km from Emalahleni town in the Delmas Local Municipality within the Nkangala District Municipality. Its global positioning system (GPS) coordinates are longitude 28^0 $54^{'}$ 50.97" East and latitude 25^0 $55^{'}$ $32.26^{"}$ South (Van Dyk, 2016).

South Africa has a population of over 26 million (Mpumalanga Province, 2003). Mpumalanga' population estimate was about 4 283 900 in 2015 which is 7.8% of

South Africa' population (Statistics South Africa, 2015). The primary economic of the province includes mining, electricity generation, agriculture and forestry (Mpumalanga Province, 2003).

3.1.2 Medupi study area

Limpopo is the South African' most northern province, as indicated in Figure 1.3 in Chapter 1. It lays adjacent the Limpopo river and boarders the African countries of Botswana, Zimbabwe and Mozambique. The province's capital city is Polokwane (formerly known as Pietersburg). Similar to Mpumalanga, it also has many towns among others are Lephalale, Makhado, Bela-Bela, Tzaneen, Phalaborwa, etc (South Africa info, 2015).

Its district municipalities among others are Capricorn, Waterberg, Sekhukhune, Mopani, etc. Medupi is situated about 21km from Lephalale town in the Lephalale Local Municipality within the Waterberg District Municipality. Its global positioning system (GPS) coordinates are longitude 27 33 29.01 East and latitude 23 42 10.08 South (Van Dyk, 2016).

Limpopo' population estimate was about 5 726 800 in 2015 which is about 10.4% of South Africa' population (Statistics South Africa, 2015). The province is in the savanna biome, with mixture of grassland and trees (bushveld). It is rich in biodiversity consisting of rare plants Baobab trees and wild animal species.

It also hosts one of the worlds' eight heritage site, Mapungubwe Cultural Landscape and boarders the Kruger National Park which extends to Mpumalanga Province. Its economic boast is also tourism, agriculture and mining (South Africa info, 2015). It has three unique centers of endemism; the Drakensberg escarpment, Sekhukhuneland and Soutpansberg (LEDET, 2004)

3.2 Research Methods

Research Design and Methodology

A research design "is a plan or proposal to conduct a research. There are three types of research designs namely; Qualitative, Quantitative and Mixed methods" (Creswell, 2009).

The differences of these three designs are as follow (Creswell, 2009):

Qualitative method – “is a means of exploring and understanding the meaning individuals or groups ascribe to a social or human problem. The process of research involves emerging questions and procedures, data typically collected in the participant`s setting, data analysis inductively building from particulars to general themes, and the researcher making interpretations of the meaning of the data”.

Quantitative method – “is a means for testing objectives theories by examining the relationship among variables. These variables, in turn, can be measured, typically on instruments, so that numbered data can be analysed using statistical procedures”.

Mixed methods – “is an approach to inquiry that combines or associates both qualitative and quantitative forms. It involves philosophical assumptions, the use of qualitative and quantitative approaches, and the mixing of both approaches in a study”.

Kothari (1985) also agrees with Creswell (2009) as his definition of a research design or methodology is a process of systematically solving the research problem. It further can be understood to be a science of studying how research is done in a scientific way.

The research methodology used in this research study is the mixed method as it combined both the elements of qualitative and quantitative methods. As shown on Creswell (2009) definitions above, in qualitative, the data was collected from the power stations and analysed, in quantitative, the questionnaire was developed and results analysed.

The research strategies or approaches used in this study are case study and non-experimental design such as a survey in a form of structured interviews and questionnaires. The methodology was used according to Creswell (2009) theory, as indicated in Table 3.1 below. Whereby the case studies forms part of qualitative method and survey or questionnaires forms part of quantitative method.

Table 3.1 – Alternative Strategies of Inquiry (Creswell, 2009)

Quantitative	Qualitative	Mixed methods
Experimental designs **Non-experimental designs, such as surveys**	Narrative research Phenomenology Ethnographic Grounded theory studies **Case study**	Sequential Concurrent Transformative

The case study design approach and survey method are appropriate for this research study as it assist in looking into specific project activities in order to determine the effectiveness of implementing EA conditions to such projects activities. The case studies used for this research study are Eskom' Kusile and Medupi Power Stations. These two developments are the mega projects in South Africa for the generation of electricity. The developments have both acquired environmental authorizations with which they should comply with. This study is therefore assessing the effectiveness of such compliance with the acquired EAs.

The survey research method in a form of questionnaires was also appropriate in this study as it assisted in determining the understanding of the project implementers to EA compliance.

This approach of the use of case studies and questionnaire was selected in this study because other authors such as Jordaan (2010) and Youthed (2009) used it in their studies and acquired positive results of stating the compliance status of the Mooi River Mall construction and the Eastern Cape EIA projects implementation.

Jordaan (2010) used the case study of Mooi River Mall for the masters' research study on the EIA follow-up, where she critically analysed the predictions and compliance of the mall which was built over a river. The study shared information on the insight of EIA follow-up.

Robson (2002), as cited by Jordaan (2010, p 16) emphasises the case studies as a fundamental research strategy with its own designs rather than been a flawed experimental design. According to Yin (2003), as cited by Jordaan (2010, p 16), "it is therefore not surprising that case study research has been a common strategy in many applied fields of research and basic disciplines for example: psychology,

social studies and urban planning." Youthed (2009) also used the case studies for the doctorate research study for assessing the potential application compliance submitted in terms of EIA regulations in the Eastern Cape.

Whereas non-experimental or survey research uses questionnaires or structured interviews for data collection, with the intent of generalizing from a sample to a population (Babbie (1990), as cited by Creswell (2009, p 12). Kothari (1985) adds that the survey research method collects data from a comparatively cases at a particular time. However, Welman and Kruger (1999, p 85) mention that there were no satisfactory general term for non-experimental research and that the most satisfactory term was survey research, whereby the term tends to be associated mainly with opinion surveys.

Qualitative research uses various methods where the researcher explores in depth a program, event, activity, process or one or more individuals (Creswell, 2009).

Furthermore Eysenck (2004) indicates the similar distinction between quantitative and qualitative research where in quantitative research, the data or information obtained is expressed in numerical form. Examples can be records of the number of items recalled, reaction times or the number of aggressive acts.

Whereas in qualitative research, "the information obtained is not expressed in numerical form however its expressed from stated experiences of the participants as well as meanings they attach to themselves, other people and/or their environment. The information in qualitative can be subjective and unfocussed and therefore need to be categorized. Its interpretation may differ considerably from one investigator to another. This method of analyses is common in interviews, case studies and observation studies," (Eysenck, 2004). The case study research method was used for this research and the methods structure used is as follows:

3.2.1 Data collection

The major element after research design and methodology structure is the "specific research methods that involve the forms of data collection, analysis and interpretation that researchers propose for their studies," (Creswell, 2009).

According to Creswell (2009), in qualitative methods the researcher takes field notes on the behavior and/or activities of individuals at the research site. The participants may also be engaged from a non-participant to a participant role.

3.2.1.1Site Visits

Three site visits were conducted per power station between February and October 2015. This was for making observations related to the practical way of doing things particularly compliance with the projects EA conditions. The dates of these site visits are indicated in Table 3.2. Field notes and photographs were taken on site and findings are captured in Chapter 4 of this report. Photographs provide the state of the environment at a specific time and serve as proof of observations made during site visits. Most authors such as Youthed (2009), Jordaan (2010) and Eskom (2015b) made use of photographs to elaborate their statements.

All site visits were arranged through a telephone and formal outlook appointment (attached in Appendix III) created and sent to each power station environmental manager and their team. The first site visits were conducted together with a student from the Witwatersrand University who is currently studying towards a Master's degree in a similar research topic. During all the site visits within the power stations, as indicated in Figure 4.3 of Chapter 4, the environmental officials were responsible for taking the researchers through the sites.

The first site visit was for familiarisation with the projects sites and location, meeting the project implementers, observation of how the EA is implemented, taking photo graphs, obtaining data such as copies of EAs, environmental audits reports, incidents reports and etc. Obtaining copies of the EAs for both the power stations, made it easier to be aware of the conditions the projects are expected to comply with. The audit reports assisted in understanding the projects compliance over the years since construction commenced in 2007 for Medupi and 2008 for Kusile. Photographs assisted in elaborating the observations made during the site visits and putting the content in a picture for better understanding of the report reader.

Table 3.2 - Site visits conducted

Site visit	Purpose of site visit	Kusile Power Station	Medupi Power Station
1st	- Familiarisation with the projects sites, - Meeting the project implementers, - Observation of EA implementation and compliance - Data collection (copies of EA, audits reports, etc)	01 April 2015	27 February 2015
2nd	- Completion of questionnaires	30 July 2015	9 July 2015
3rd	- Completion of questionnaires - Collection of outstanding data	28 October 2015	10 July 2015

The second visit was conducted mainly to meet participants for the completion of the questionnaires. Questionnaires were initially sent through to participants via emails. The power stations environmental managers assisted with distribution to the target group but very few responses were received. The target group was determined by identifying key participants who are involved in the EA implementation. These were mainly the environmental practitioners, project coordinators or managers, engineers and ground workers.

The third site visit was initiated to finalise the completion of questionnaires by participants for Medupi as well as collecting outstanding data such as the environmental management committee terms of reference for Kusile.

3.2.1.2 Qualitative interviews

Creswell (2009) explains that the researcher can conduct face to face interviews, telephone interviews, or engage in a focus group interviews with participants where

participants are at least six to eight in each group. The interview questionnaires can also be made unstructured, open-ended questions and few in number as well as intend to obtain opinions from the participants.

In this research study, face-to-face interviews were conducted with participants during all the site visits for both the power stations. A questionnaire with ten (10) open-ended questions (attached in Appendix IV) was used to get the opinion regarding the power station EA compliance from the participants. Face to face interview is appropriate to this research study as the targeted groups of participants are not all necessarily from the environmental field of study. Further clarification of questions was therefore necessary.

Both face-to-face and one on one interviews were conducted for both the power stations during and after the site visits. These exclude the engagements with the participants for the purpose of completing the questionnaires which is discussed on the paragraphs below.

3.2.1.3 Survey design

The objective of the questionnaire in this research study was to determine the understanding and knowledge of project implementers on the importance of complying with the EA conditions and challenges experienced with compliance. The questionnaire is appropriate as it does not only target the participants with environmental management background but also targets various project implementers within the power station environment. The participants were selected randomly within a target group, as indicated in Table 3.3. The benefits of random selection is that each potential participant get the equal probability to be selected ensuring that the participation will be the representative of such a population (Keppel (1991), as citied by Creswell (2009, p 155).

The questionnaire was completed at each power station by at least twenty-five (25) project implementers or participants over a period of time prior, during and after the site visits, totaling to fifty (50) participants for the two power stations. All the fifty (50) participants as proposed in this research study proposal managed to complete the questionnaires.

Creswell (2009) explains that questionnaire data can be collected in self-administered and interview approaches. In this case, the questionnaires were completed in both methods whereby three senior managers and most environmentalists, eight (8) completed the questionnaires on their own, responding to the questionnaire email request sent. The other thirty-nine participants completed the questionnaire through an interview approach.

This interview approach was initiated and conducted as most participants thirty-nine (39) did not respond to the email request for completing the questionnaire. Most of these interviews were conducted during the second site visit to the power stations. The attendance register for these questionnaire interviews was recorded as well. The attendance register in this case was completed in order to proof the communications or interviews undertaken with the participants. All the targeted fifty (50) participants managed to complete the questionnaires during different times (responding to emails and interviews during site visits).

The study or questionnaire involved stratification of the population. Fowler (2002), as cited Creswell (2009, p 148) describe stratification “as the specific characteristics of individuals (e.g. females and male) represented in the sample reflecting the true proportion in the population of individuals with certain characteristics”.

This research study questionnaire included the differentiation between male and female as well as the number of years each participant worked at the power stations. However, the gender identification does not serve any purpose for this study and therefore not indicated on the questionnaire results findings.

The number of targeted participants was selected based on the number of internal environmental personnel for each power station whereby Kusile has a total of eleven Environmentalists and Medupi has a total of eight Environmentalists serving the power station. The participants were then grouped as indicated in Table 3.3.

The questionnaire pilot study may be undertaken in a research projects in order to pre-testing it and the results may require the questionnaire to be edited (Kothari, 1985). The pilot study for this research study was conducted using the peer group of three participants in the field of Environmental Science.

Table 3.3 - The questionnaire target groups per power station

Target group	Number of employees per target group
Environmentalists Senior management Engineers Project managers/ coordinates ground workers Total Total participants for both the power stations	5 3 5 5 7 25 per power station 50 – combined for 2 power stations
Population per power station	500 at 2015 - Kusile 700 at 2015 - Medupi

Table 3.4 - Questionnaire scale of answers

Scale	Description as it relates to the questionnaire
Strongly agree	The participant agrees to the question or statement fully without any doubt.
Agree	The participant averagely agrees to the question or statement, whereby evidence or proof to the question is not obvious.
Neutral	The participant does neither agree nor disagree with the question or statement. Or where the participant did not answer the question or statement.
Disagree	The participant averagely disagrees to the question or statement, but the answer to the question is doubtful and not obvious
Strongly disagree	The participant disagrees to the question or statement fully without any doubt

The results were positive in a way that the participants agreed to the questions tabulated on the questionnaire. This was in a form of requesting the participants to review the questionnaire through an informal one on one interview and determine whether it is appropriate for addressing the research question of this research study.

After the pilot study no questions were required to be changed however further clarity was required to explain or elaborate some questions and the meaning of the scale or scoring used, as indicated in Table 3.4. The clarification requests were made by one of the three peer group participant.

3.2.1.4 Qualitative documents

Qualitative documents are public or private documents the researcher collects during the research process. Examples of these documents are newspapers, official reports, letters, emails and etc (Creswell, 2009).

In this research study, all data such as official reports EA, audit reports, incidents report, Environmental Monitoring Committee (EMC) documents, ECO appointments and internal monitoring reports were obtained from Kusile and Medupi Power Stations' Environmental Management Department. Information was requested through emails and Eskom permission letter was obtained, see Appendix VII.

The benefits of obtaining these documents from the specified departments are that the departments are responsible for leading and ensuring the EA compliance at the power stations. Therefore, the documents obtained from these departments can be reliable. The other data such as further audits reports and power stations background information were obtained from Eskom head office in Megawatt Park situated in Johannesburg in the Gauteng Province.

The external audits reports were used to study the compliances of the power stations over the year since commencement. Graphs were developed to indicate the pattern of compliance and are further detailed in Chapter 4 of this report.

3.3 Data Analysis and interpretation

Once the researcher decides on an appropriate research design and suitable means of measuring the relevant variables, the next step is to choose an appropriate statistical procedure in order to analyse the obtained data (Welman and Kruger, 1999). Variables considered for this study are the EA conditions, compliance and defaults.

The process of data analysis “involves making sense out of text and image data. It is an on-going process involving continual reflection about the data and asking analytic questions. It also involves collecting open-ended data, based on asking general questions and developing an analysis from the information supplied by participants” (Creswell, 2009).

Welman and Kruger (1999) have two basic approaches, namely ethnographic summary and systematic coding through content analysis which can be used to analyse data for a qualitative research. Content analysis produces numerical descriptions of the data whereas ethnographic approach relies on direct quotation of the data discussions.

Similarly to Welman and Kruger (1999), Rossman and Rallis (1998), as cited by Creswell (2009, p 186) explain data analysis as coding in a process of organising the material or data into chunks or segments of text before bringing meaning to information. He further explains that data coding is taking data or photographs gathered during data collection, segmenting it into categories and labeling those categories with a term.

Data analysis used for this research study is data coding and content analysis. Whereby text data from documents such as EA, environmental audit reports, EMC reports and incident reports; site observations and site photographs (both gathered during data collection and captured during the site visits) were segmented into categories given a single term and information analysed. These term categories are highlighted in each Section of Chapter 4 within results presentation and discussion and among these terms are lodged appeals, un-authorised stream diversion, EMC and etc.

The results were analysed and interpreted in terms of the research problem addressed at the beginning of this study report, Section 1.3. This analysis tries to

explain the results meaning and implication in the light of the purpose of the research study, Section 1.4, as adopted per Welman and Kruger (1999) theory. This theory involves indicating the meaning and implication of the finding in light with the research purpose.

EA conditions were assessed individually and proof of compliance requested. The use of graphs, diagrams and charts were also used to assist in elaborating the results.

Findings of this research are analysed and captured in Chapter 4 of this report. The findings and results obtained were used to: –

- Determine whether there are any conditions that are too difficult, insignificant and/or lenient to implement and comply with;
- Identify any gap in EA conditions that could cause any environmental damage; and
- Draw up a conclusion on the effectiveness of compliance with the projects EA conditions, as the findings provided a clear understanding or observation of the power stations' compliance towards EAs.

3.3.1 Questionnaire analysis

According to Welman & Kruger (1999), "once the data is collected, sense should be made out of it, and in order to do this, data should be organised and coded so that it can be analysed and fed into a computer to proceed with the analysis". The following was used to analyse the questionnaire as per Welman & Kruger (1999) theory:

- "**Count**" – the number of questionnaire participants who participated on a ten-point questionnaire. The questionnaire questions enquired about the EA compliance. The answer section ranged from 'strongly agree, agree, neutral, disagree and strongly disagree'.
- "**Describe**" – understanding the importance of the EA and its conditions;
- "**Compare**" – the responses of different project implementers to the questionnaire questions; and

- "**Categorize**" – identify patterns of themes through the use of a chart or graph. The similar answers of the questionnaires from strongly agree to strongly disagree were grouped together and presented in a graph shown in Chapter 4 of this report.

3.4 Validity of information

Qualitative validity means "that the researcher checks for the accuracy of the findings by employing certain procedures" (Creswell, 2009). Whereas qualitative reliability "indicates that the researcher' approach is consistent across different researchers and different projects" (Gibbs (2007), as cited by Creswell (2009, p 190).

Procedures employed for validating the information are as follows (Creswell, 2009):

- Checking the report to ensure that they do not contain obvious mistakes made during transcription.
  The mistakes identified were the followings:
    - The mistakes identified were mostly the language errors and were rectified.
    - To get the correct number of graves relocated for Kusile. The Kusile Environmental Manager initially indicated few numbers however the heritage report indicated more graves that were affected by the Kusile projects and required to be identified.
    - Kusile' first EA was appealed and the initial data collection referred to only the first issued EA, as a result the revised EA was not considered. This mistake was picked up during the interview with the Kusile Environmental Manager on the first site visit. Thereafter the second amended EA was also referred to and used for this study.

The rectification of the mistakes assisted the data collected and results to be as accurate as possible.

3.5 Ethics principles

The research ethics principles applied in this study are in accordance with the UNISA Policy on Research Ethics1 (UNISA, 2012). The ethics application made indicated the use of human participants through questionnaires, conducting of site visits (discussed in Section 3.3.1.1 above) and conducting this research study with integrity.

3.5.1 Integrity

UNISA (2012) requires researchers to be competent and accountable. Furthermore that researcher should act in a responsible manner and endeavor to achieve the highest possible level of excellence, integrity and scientific quality in their research.

This research was conducted with professionalism, integrity, commitment and unbiased approach on recording of findings. This research report strived to ensure that the study findings are reliable and can be replicated as a comprehensive study was undertaken. Furthermore, in my view this study will contribute to knowledge in the environmental science field.

UNISA policy of Research Ethics1 (2012) requires researchers that undertake research involving human participants to obtain approval from an appropriate Ethics Review Committee of UNISA. In this study since the human participants were used during the questionnaire exercise, the Ethics approval has been applied for and approved with reference number **2014/CAES/141** and a copy is attached in Appendix VII.

3.5.2 Moral principles

UNISA policy of Research Ethics1 (2012) “promotes the four internationally recognized moral principles of ethics that a research should be based on, namely; autonomy, beneficence, nonmaleficence and justice”.

This research ensured the independence, rights and dignity of research participants in that the purpose of the study was clearly explained and participants were not forced to participate in interviews and/or questionnaire exercises. Healthy

relationships with the participants were developed and most participants are very keen to participate and offered their time for the study.

3.5.3 Informed consent

The participation of individuals during the research study “should be based on their freely given, specific and informed consent. Researchers should respect their right to refuse to participate in research and to change their decision or withdraw their informed consent given earlier, at any stage of the research without giving reason and without any penalty” (UNISA, 2012).

Participants should further provide their consent in writing and preferably accompanied by their signature (UNISA, 2012). The participants were asked to complete the UNISA CAES consent form (attached in Appendix VIII) as their indication for willingness to participate in the research study. Explanation was also made to participants that they should be willing to participate in the research project whether for an interview or completion of a questionnaire.

Creswell (2009) explains that participants can be randomly assigned to groups. Participants were assigned to groups in terms of their disciples such as engineers, management, environmentalists, ground workers and project coordinators, as indicated in Table 3.3 above.

All the participants completed the consent forms. Initially the questionnaires were sent to two environmental managers (Kusile and Medupi Managers) through emails for their distribution within the power stations but only eleven responses were received. A follow-up site visits were then conducted to request remaining thirty-nine participants to respond in a form of face-to-face interview where a one on one interview was conducted.

The questionnaire interview or administration with participants took from five (5) minutes to fifteen (15) minutes. Five (5) minutes was mostly where participants did not have much questions and fifteen (15) minutes was where participants asked more questions and requested clarifications. The group that took lesser time was the ground workers as they did not ask further questions and those that took more time were the engineers as they asked follow-up questions on the questionnaire.

Furthermore, Eskom permission was sourced in order to be able to use the two power stations, Kusile and Medupi as case studies for this research project. The Eskom permission was granted in September 2014 and a letter of the permission is attached in this report as Appendix VII. This permission was sourced through telephone and emails from the Eskom Environmental Manager as well as the Eskom General Manager of Research.

3.6 Limitations

The limitations were in conducting the site visits as per dates anticipated on this research study proposal. The power stations personnel were always busy with other work for the stations and found it difficult to accommodate students however they were all willing to assist. As a result all the dates of the site visits were not conducted on the dates anticipated as per the research study proposal.

The questionnaires were also not completed on time. Initially questionnaires were emailed to participants in February 2015 but only eleven (11) out of fifty (50) responses were received. Email reminders were also sent but no responses were received. A follow-up face to face interview was then conducted with the remaining thirty-nine (39) participants.

The use of Kusile external audit reports required consent from the consultant who conducted the audits to be acquired. This consent was acquired.

The purpose of this Chapter was to identify the research design and methods used in this research study. The research methodology used was mixed method as both the qualitative and quantitative methods applied as well as the case study and survey design approaches. The next Chapter will present and discuss the research study findings.

CHAPTER 4: RESULTS AND DISCUSSION

This Chapter presents the results of the study and discusses the findings. The Chapter highlights the periods EIA for the case studies were conducted as well as interpreting the findings during the EA implementation.

4.1 Kusile Power Station case study

Kusile obtained a number of authorizations for its different activities and they are as follows:

- Main power station and associated infrastructure first issued EA, DEA Ref: 12/12/20/807 (05 June 2007);
- Main power station and associated infrastructure revised EA, DEA Ref: 12/12/20/807 (17 March 2008);
- Railway line, DEA Ref: 12/12/20/1488 (23 April 2010);
- Section 24G EIA application for the Stream diversion, DEA Ref: 12/12/20/2105 (26 July 2012); and
- Dirty water pipelines crossings within wetlands, DEA Ref: 14/12/16/3/3/1/700 (05 April 2013).

Environmental structure of Kusile Power station

The power station has its own internal environmental department and has further appointed an external environmental consultant which serves as the Environmental Control Officers for the project. The main contractor and all sub-contractors have their own environmental representatives dedicated for Kusile and in total the environmental personnel (including contractors environmental representatives) working on site daily are forty-four (44), as indicated in Figure 4.1 (Kusile Environmental Manager, 2015).

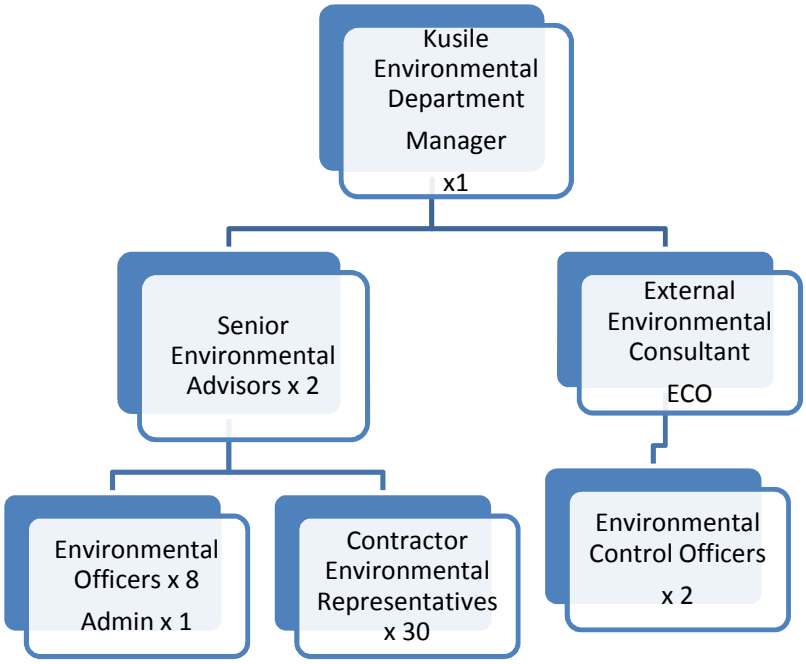


Figure 4.1 Environmental management personal structure of Kusile (Kusile Environmental Manager, 2015)

The focus for this study is on the compliance for the main power station EA. The construction commenced in 2008.

4.1.1 Results Presentation and Discussion

4.1.1.1 Lodged appeals

The first EA issued for Kusile on 05 June 2007 by DEA was appealed by at least two members of the public, a landowner who is a local farmer in the area and the poultry farm. The appeals were submitted to DEA shortly after the decision (EA) was issued to Kusile (Van Schalkwyk, 2008). It was undertaken in terms of Section 35 (3) of the Environment Conservation Act, Act No.73 of 1989 which states that "… any person who feels aggrieved at a decision of an officer or employee exercising any power delegated to him in terms of this Act or conferred upon him by regulation, may appeal against such decision to the Minister or the competent authority concerned…". The grounds of appeals are, as indicated in Table 4.1 below.

Table 4.1 - Grounds of appeal against Kusile (Van Schalkwyk, 2008)

Appeal aspect	Appeal description
Landowner and a farmer appeals	
No consultation	According to the landowner and a farmer, he was not consulted regarding the project
Impact of the ash dump	The ash dump will be detrimental to the health of the farmer' family and animals
Impact on lifestyle	The power station will impact on a normal way of life and living for the farmer and his family
Poultry farm appeals	
Cumulative impacts	Poultry farm submitted that an assessment was not done with regard to the cumulative impacts of the proposed power station and the other mine in the same area
Adverse air impact	Poultry farm alleges that there will be adverse air impact on its poultry farm, which will detrimentally affect the health of its chickens
Socio-economic impacts	According to the poultry farm, there will be potential negative socio-economic impacts. The appellant stated that its staff component of 110 persons and their many dependents are deeply affected and concerned as to their future jobs and their health, being in such close proximity to the proposed power station
Impacts on water quality	There will be impacts on the quality of the water from the poultry farm boreholes, of which a large quantity is used on the poultry farm for various purposes

The DEA on receiving these appeals as shown in Table 4.1 above, it made investigations and eventually made a decision to dismiss the appeals lodged against the decision of Kusile EA issued on 05 June 2015, and to grant the EA for the construction of the proposed Kusile Power Station and its associated

infrastructure (Van Schalkwyk, 2008). The reasons for DEA' decisions to dismiss the appeals are, as indicated in Table 4.2.

DEA also revised the issued EA with the new EA issued on 17 March 2008 in order to address the received appeals concerns. And the added conditions were as follows (Van Schalkwyk, 2008):

- The applicant, in consultation with the relevant appellant (poultry farm) should, on a quarterly basis, monitor the reproductive health of the poultry on the appellant' farm and if it is conclusively established that there is a causal connection between the emissions from the power station and any deterioration in the health of the chickens, corrective measures should be implemented by the applicant (Kusile); and
- The applicant should establish an ambient air quality monitoring station to monitor the ambient air impact of the power station.

Table 4.2 - The reasons of DEA' decision to dismiss appeals against Kusile EA (Van Schalkwyk, 2008)

Aspect	Reasons for DEA decision
Consultation or public participation	There was sufficient consultation in this matter and that the legislative requirements in this regard have been satisfied
Project need	The need and desirability for the project has been adequately demonstrated. The proposed project is part of the applicant's new capacity installation programme and is intended to meet some of the pressing electricity demands of the country
Conducted EIA	The Director-General adequately considered the major anticipated environmental impacts of this development before issuing the EA on 05 June 2007
Impacts of the power station on human and animal health	The potential impacts on human and animal health from the ash dump can be mitigated to acceptable levels through the conditions set by the authorization and other measures, but that additional measures should be put in place to ensure adequate monitoring of air quality.

	The power station will be located within the newly proclaimed Highveld Priority Area. It is therefore envisaged that detailed are quality management interventions will be made within the area to generally improve ambient air quality. In addition, the Minister of DEA is satisfied that the technology utilized for this development conforms to international best practice standards and will set the standard for similar development in South Africa in the future
Conditions of EA	The conditions included in the revised EA are deemed adequate to provide for the mitigation of the identified impacts to acceptable levels
Socio-economic benefits	The development will result in socio-economic benefits, not only to the Witbank area, but to South Africa as a whole
Sustainability principles	By implementing the mitigation measures contained in the revised EA, the principles contained in Section 2 of NEMA, Act No 107 of 1998 can be substantially complied with

- Monitoring of the health of poultry farm

It was found that Kusile appointed a consultant in 2013 to conduct the required monitoring of the poultry farm. However, since the development is still under construction and no operations done at stage, the consultant's work is to conduct a baseline data of the poultry farm so that the baseline can be used against the results or impacts during operational period. This monitoring is conducted quarterly as required by the EA.

- Establishment of the air quality ambient monitoring station

It was also found that Kusile had established air quality ambient monitoring stations at Phola human settlement which is about 15km from Kusile, as indicated with a blue circle in Figure 4.2, referred to as Phola monitoring station (Phola MS). Air monitoring station is an equipment facility that assists in tracking the levels of pollutants in the air. The station was installed in August 2007 and also services other power stations in the same vicinity. As construction is still underway, the

station monitors the background conditions prior to Kusile commissioning. The monitoring reports are done on a quarterly basis.

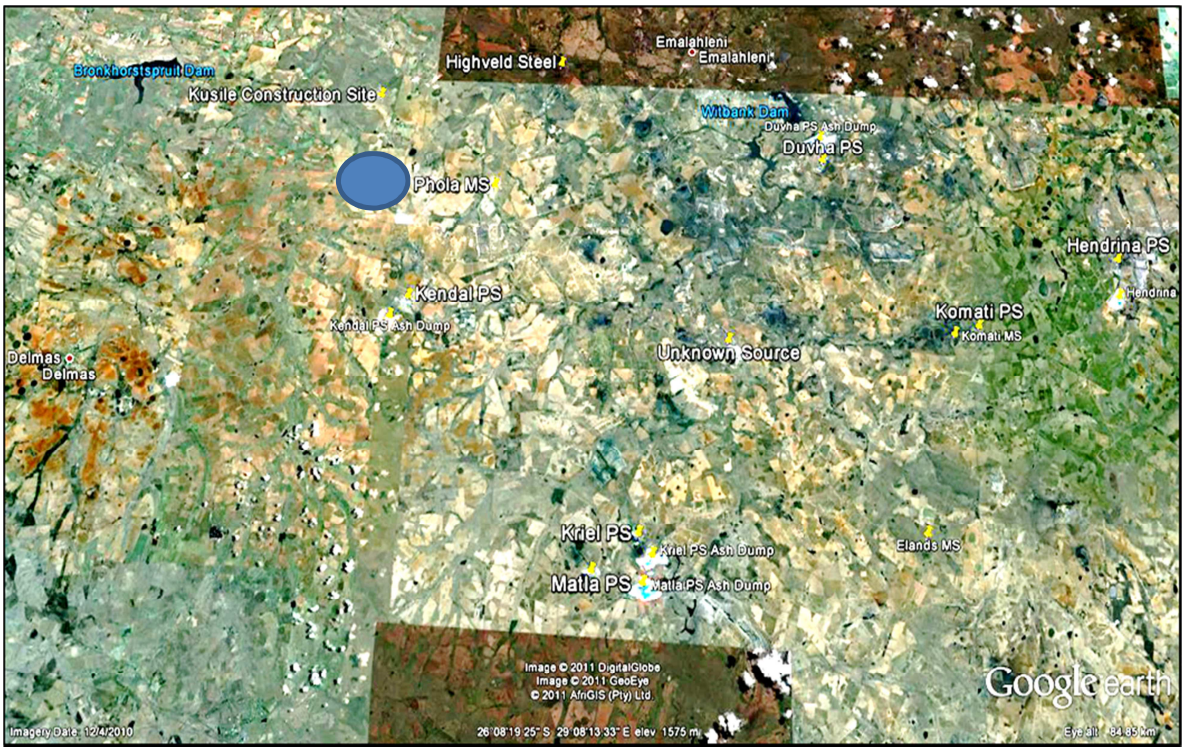


Figure 4.2 Air quality ambient monitoring station at Phola human settlement (Eskom, 2015c)

Kusile further established bucket dust fallout monitoring points to monitor the amount of dust around the power station. A total of nine monitoring stations were installed for this purpose, as indicated in Figure 4.3, and monitoring is conducted on a monthly basis. It was noted that dust suppression is practiced to remove the amount of dust blow (Kusile Environmental Manager, 2015). Neither the dust blow nor dust suppression was observed by the researcher during the site visit on 01 April 2015, as was with Medupi.

- **Implication in the study purpose**

The two specific additional EA conditions of the revised EA after the appeals were found to be well implemented by Kusile. Firstly, the health of the poultry farm is

been monitored however as the power station is not yet operational, no much impacts can be identified except collection of baseline data at the poultry farm. Secondly, the air quality ambient is monitored as required at the nearest community of the power station.

Figure 4.3 Location of dust monitoring points (Eskom, 2015a).

4.1.1.2 Unauthorized Stream diversion

The Kusile EA was issued in terms of the ECA, schedule 1 regulation R 1182 as already mentioned in previous Chapters and most of the activities were not covered by ECA list of activities requiring the EIA to be undertaken. However, Kusile only commenced with construction in 2008 and by then the EIA list of activities had been revised and repealed by the 2006 EIA Regulations, GN R385 of 2006.

Kusile EA authorised the development among others the power station; coal stock yard; coal and ash conveyors; ash disposal facility/dump; water and wastewater treatment facilities; access roads; a dam and railway line. However, it did not authorise the activity within a watercourse for diverting the stream. This activity was neither accessed during the EIA process nor applied for (Eskom, 2012a). It has to

be noted that even though the EA did not mention and authorise this activity, a water use license (WUL) for diverting the stream was acquired and approved by the Department of Water and Sanitation (DWS) in April 2011.

The power station diverted a natural stream running south of the power station plant, as indicated in Figure 4.4, to cater for the required construction of the coal stock yard and its conveyor belts. As a result this activity contravened Section 24F of NEMA which states that "*notwithstanding any other act, no person may commence an activity listed or specified in terms of Section 24 (2) (a) or (b) unless the competent authority has granted an environmental authorization for the activity*" and required that Section 24G of NEMA for the rectification application for commencing with a listed activity without authorization be applied for.

This EIA rectification application was then undertaken between 2010 and 2012. The EA was issued on 26 July 2012 by DEA.

- **Lessons learnt by the project team**

Due to the nature of the power station' construction, most activities unfolded as the construction progressed (Kusile Environmental Manager, 2015). This becomes a challenge to ensure compliance with all current related legislations as most of the activities now requires EIA to be undertaken prior to commencement of such activities. As a result the power station has other EIAs currently underway for such activities. This is to ensure Kusile' compliance with current and related legislations as well as avoiding any legal contravention as had occurred with the stream diversion.

The Kusile lessons learnt on the legal contravention of the stream diversion was shared with all the Eskom Environmental Practitioners at an annual environmental conference held in Johannesburg in 2012. During the lessons learning session, it was shared that the EIA Project Manager should ensure that all the activities of a proposed development are assessed and applied for in the EIA process. Furthermore that too much reliance on the EAP running the EIA should be avoided (Eskom, 2012a).


(a)

(b)

(c)

Figure 4.4 Diverted stream (a) Diverted stream with a small bridge, (b) Start of the diverted stream and (c) Diverted stream south of the power station plant and old stream route

- **Implication in the study purpose**

The meaning and implication of this finding is that the unauthorized stream diversion is not classified as non-compliance to the Kusile EA rather non-compliance to NEMA Section 24F, as an authorization was supposed to have been acquired prior to execution of the activity.

The researcher's view is that other than ensuring that the development activities are assessed and applied for, the detailed development scope of work (all activities) should be clear and understood by all involved in the EIA process including the EAP and authorities. Following this approach, relevant stakeholders or authorities will be able to pick any oversight early in the process and it may assist in minimizing and avoiding unintended contraventions.

Proper development planning should be done timeously in the initial development stages to provide opportunity for the EIA project team to analyse all relevant activities requiring authorization. Furthermore, screening of project associated activities should continue throughout the project cycle phases in order to close all gaps in ensuring that all activities are authorised.

Legal contravention of these cases can cause a distress to the environment and people at large, as the unmanaged work within a water course may results in water pollution and contamination, disturbance and destruction of aquatic life, sedimentation flooding, destruction of water courses, etc.

4.1.1.3 Potential wetland destruction

The original design of the 10 year ash disposal facility authorised together with the main power station EA, was covering the wetland area. However, the acquired WUL from DWS only authorised Section 21(g) of the National Water Act, Act No. 36 of 1998 which state that "*disposing of waste in a manner which may detrimentally impact on a water resource*" and did not authorised Section 21 (c and i) of the same Act which state that "*impending or diverting the flow of water in a watercourse and altering the bed, banks, course or characteristics of a watercourse*".

The project team at Kusile was able to pick this unauthorized activity prior to construction and has stopped the construction of the ash disposal facility near to the wetland area, as indicated in Figure 4.5, while the WUL is applied for. The WUL was eventually issued by DWS in 2009.

The wetland assessment survey as per EA condition 3.2.1 was conducted and sensitive areas identified.

- **Implication in the study purpose**

The disturbance of wetland was not authorised in the main Kusile EA, as term 1(I) "schemes for the abstraction or utilization of ground or surface water for bulk supply purposes". The construction of the ash disposal facility avoided the wetland area, therefore there is no non-compliance nor legal contravention as no activity was done.

However, it has to be noted that the applied water use license application at DWS was only addressing the Section 21 (c and i) in terms of NWA as mentioned in paragraphs above and still awaits decision, and does not cover the authorization in terms of the 2014 EIA Regulations. A commencement and/or continuation with an ash disposal facility in the wetland will therefore results in a legal contravention in terms of Section 24F of NEMA should the EA not be acquired prior to such activity.

Figure 4.5 Wetland area near ash disposal facility

4.1.1.4 Environmental Monitoring Committee (EMC)

EA condition 3.11 requires Kusile to establish the EMC with the purpose of executing the following:

- To monitor and audit compliance with the conditions of the Kusile EA, with environmental legislation and with specific mitigation requirements as stipulated in the environmental impact report and the environmental management plans;
- To make recommendations to DEA on issues related to the monitoring and auditing of the project; and
- To decide on the frequency of meetings, should a need arise to review the prescribed frequency. This change should be communicated to the DEA for acceptance.

According to this EA condition, the EMC is to meet on a bi-monthly basis from the inception of the project. The EMC was established by Kusile in 2008 with all the requirements of the EA and the EMC terms of reference are attached as Appendix IX. The EMC had meetings bi-monthly but later decided to change the frequency from bi-monthly to quarterly. EA condition 3.11.4 requested that should there be a need to change the frequency of meetings, it should be in consultation with DEA. The DEA acceptance of this recommendation was approved.

- **Implication in the study purpose**

This condition is fully complied with, and with all the EMC requirements as in EA condition 3.11.2, the EMC shall consist of the following members:

- An independent chairperson;
- The suitably qualified and experienced ecologist;
- Representatives from the public (at least two people);
- Environmental Control Officer;
- A senior site manager from the main contractor; and
- An air quality specialist.

This condition provides a good opportunity for different influential personnel to be fully involved in the development' environmental management and ensures that the Kusile EA is complied with at various levels. More interestedly is that the public are also kept involved at the high level and right platform.

4.1.1.5 Excessive vegetation clearance

During the site visit conducted on the 01 April 2015 it was observed that the vegetation clearance unlike at Medupi which has more indigenous vegetation cover within and around the development area, Kusile's vegetation has been excessively removed within the development area, as indicated in Figure 4.6. It however has to be noted that the vegetation around and within Kusile' surroundings are minimal and mostly grasses and shrubs, as indicated in Figure 4.7. This was also mentioned and a concern to Eskom (Senior Environmental Corporate Specialist, 2015).

- **Implication in the study purpose**

EA condition 3.3.2 states that “the existing vegetation cover of the site should be retained through selective clearing. This will ensure that screening takes place during the construction and operational phases of the development.”

It was evident from the site observation that proper selective clearing in all areas was not done as much vegetation was removed unnecessarily. The negative impacts of the removal of more vegetation cover has potential to contributing to soil erosion and resulting in more sediments been deposited in the nearby streams.


(a)

(b)

(c)

(d)

Figure 4.6 Vegetation clearances (a) Clearance at the entrance area, (b) Clearance at the waste storage area, (c) Clearance at the ash disposal facility construction area and (d) Clearance at the coal stockyard area

4.1.1.6 Rehabilitation and other required permits

EA condition 3.16.1 requires that no exotic plant species may be used for rehabilitation purposes and only indigenous plants may be used. Furthermore EA condition 3.17 requires that other legislations such as the National Heritage Resource Act, Act No. 25 of 1999; Occupational Health and Safety Act, Act No. 85

of 1993; National Water Act, Act No. 36 of 1998; and others should also be complied with.

Figure 4.6 Type of vegetation cover at Kusile and surroundings

Kusile developed a plant nursery at the power station area where the indigenous plants from the search and rescue exercise are kept. Their plan is to return the plants back after construction as part of rehabilitation purpose and also complying with EA condition 3.16.1. Kusile further acquired a permit for removal of indigenous protected plants from the Mpumalanga Tourism and Park Agency, copy of permit is attached in Appendix X.

- **Implication in the study purpose**

This condition is also fully complied with even though most vegetation was extensively removed as seen in Section 4.1.1.5 above. The protected plants permit was acquired and rehabilitation done accordingly. Some rehabilitation is done concurrent with the construction, as indicated in Figure 4.8 below.

Figure 4.8 Rehabilitation of some area at Kusile

4.1.1.7 Water quality management

Complains of excessive sediments downstream of Kusile

The public complains that were received by Kusile were of more sediments downstream of the power station and the poor water quality (Senior Environmental Corporate Specialist, 2015).

- **Implication to the study purpose**

The complaints may have been due to a number of reasons, firstly due to the stream diversion, secondly due to the soil erosion from disturbed areas within Kusile and thirdly from other developers other than Kusile. However, the impacts need to be looked at thoroughly to determine the root cause so that proper mitigation would be employed.

4.1.1.8 Access road

The access road to the power station is crossing a number of streams and wetlands. By the time Kusile needed to commence with its construction, the WUL

was not yet approved by DWS. The project team in agreement with DWS decided to commence with road portions that did not affect streams and wetlands so as to not delay the development process. The portions affecting streams and wetlands were constructed later when the WUL was issued in October 2009.

- **Implication to the study purpose**

The construction of the roads was well managed and all conditions complied with.

4.1.1.9 Oil spillage incidents

Kusile had several oil spills and the spillage incidents were reported and cleaned-up accordingly. Bioremediation in-situ treatment for minor spillages was undertaken and oil contaminated soil for major spillages was disposed of (Kusile Environmental Manager, 2015).

- **Implication to the study purpose**

No oil spillages were observed during any of the site visits conducted.

4.1.1.10 Graves relocation

Kusile had graves that were relocated, most of the graves and old houses where identified during the EIA phase. Another heritage assessment study phase 2 was conducted in order to relocate the graves; about two hundred (200) graves were relocated to a cemetery in Phola human settlement near Kusile (Kusile Environmental Manager, 2015). The old houses were also demolished to allow for the power station construction. The process occurred between 2008 and 2010, the heritage permit was acquired in 2010 issued by the South African Heritage Resources Agency (SAHRA), and a copy of the heritage permit is attached in Appendix XI.

- **Implication to the study purpose**

The heritage impact management requirements are in EA condition 3.6, it however refer compliance to all recommendations made in the heritage impacts assessment dated October 2006 and that SAHRA should be informed if any of the identified culturally important sites are going to be impacted upon by the Kusile.

According to this EA condition, it is not indicated that neither identified cultural important sites nor graves will be relocated. However, the 200 relocated graves were conducted in following the requirements of the National Heritage Resources Act, Act no 25 of 1999 and permit acquired as mentioned above. Furthermore Van Schalkwyk (2006), in the heritage study conducted during the EIA phase does not necessarily indicate the need to relocate graves and demolish the old houses rather mention that identified sites should be preserved where possible otherwise relocate after excavation and documentation and should follow legal processes.

Kusile complied fully with this condition as they informed SAHRA as is what they are required to do in terms of the EA condition.

The heritage conditions were poorly addressed by DEA especially where the relocation of graves were clearly indicated in the submitted reports. Requirement to say “inform SAHRA” does not have weight as perhaps the condition “comply will all the requirements of Heritage Resource Act” or “permit to relocate graves should be applied for” similar to what was mentioned in EA condition 3.1.12, that “*a water use license should be applied for in terms of Section 21(g) of the NWA*”

The researcher’s view that irresponsible developers may get away easily with these type of conditions and cause unnecessary harm to both the environment and people due to their unmanaged or uncontrolled work. As “informing” can be interpreted as just informing (let knowing) as is, and not necessarily acquiring permits or requesting decision from SAHRA.

4.1.1.11 Air quality management

Requirements of the air quality management are required in EA condition 3.7. Among others Kusile is required to initiate program of support for initiatives aimed

at improving quality in the Witbank residential area, and that the program should be included in the operational EMP.

- **Implication to the study purpose**

This condition addresses the appeal concerns of the farmer as mentioned in previous paragraphs, and full compliance will also be meeting the needs and minimizing the air pollution impacts on the community at large. Other air quality requirements are still not applicable at stage as the power station is still under construction and operation not yet commenced. However, the air quality ambient monitoring station has already been installed at Phola human settlement as it also monitors other Eskom power stations. Most of the concerned pollutants during construction phase are particulate matters (Kusile Environmental Manager, 2015).

4.1.1.12 External audits

The external audits are conducted biannually by an external environmental consultant at Kusile. However, this is not a specific requirement of the EA condition. The EA only requires the records of monitoring and audits to be kept and submitted to DEA. This means no limitations to who can conduct audits; it may be internal or external personnel. It is of best practice for Kusile to contract with an external auditor to ensure unbiased process.

These external audits commenced in 2009 and have been carried out till to date. The results of all the nine audits reports conducted since 2009 to 2013 indicate compliance to both the EA conditions and the EMP of over 90%, as indicated on the graph in Figure 4.9. Most of the few identified non-compliances at the times of audits were addressed.

The compliance started at high rate of 91% in June 2009 and even higher in February 2010 at 98.26% but went slightly down in July 2010 at 96.8%. Compliance went further down in February 2012 at 95.8% however picked up on August 2012 to nearly 100% at 99.5%. The graph shows compliance results of over 90% for all audits conducted.

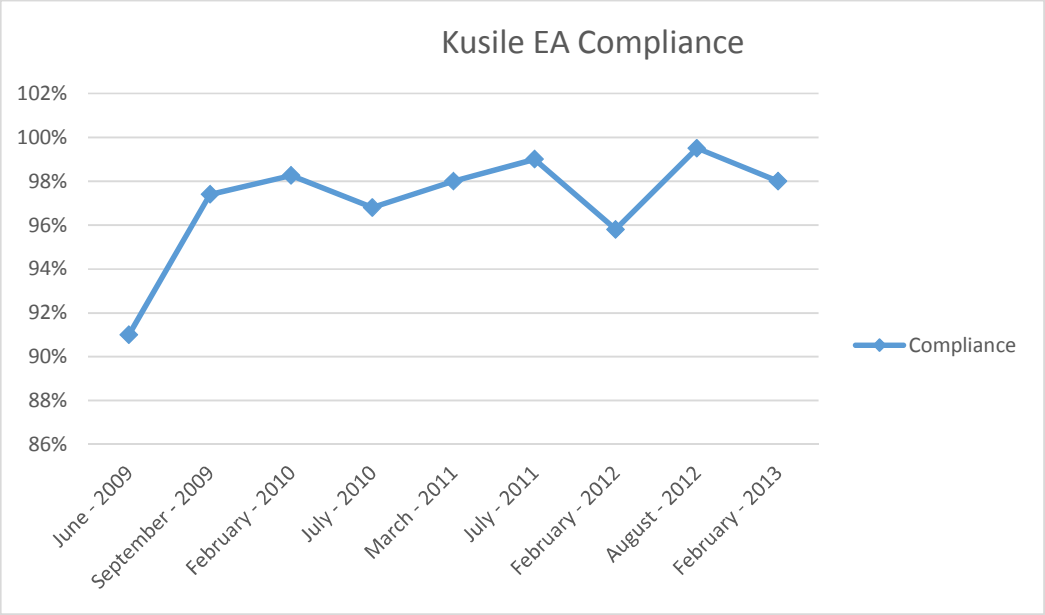


Figure 4.9 Kusile EA and EMP external compliance audits results

4.1.1.13 Environmental Management Plan (EMP)

Kusile has both the construction and operational EMP approved by DEA however this study did not review the EMP as the focus area was only the EA conditions. Though the adherence to EMP conditions is required in the EA condition, the EMP is a separate dynamic document that can be considered at another level and not catered for in this study.

4.1.1.14 Questionnaire results and discussion

The questionnaire was completed at each power station by at least twenty-five (25) project implementers or participants over a period of time prior, during and after the site visits, totaling to fifty (50) participants for the two power stations. The number of participants is described in Table 3.3 of the previous Chapter 3. Sample copies of the completed questionnaires are attached to this report as Appendix V and VI.

Most of the participants were male employees (18 males and 7 females), with between 1 to 4 years of experience in the development of Kusile. Most of the participants are aware of the Kusile EA, understand the purpose of complying with the EA and support that compliance with the EA is not a waste of time, but is

necessary for promoting sustainable development. The results of the survey or questionnaire are, as indicated in a graph on Figure 4.10.

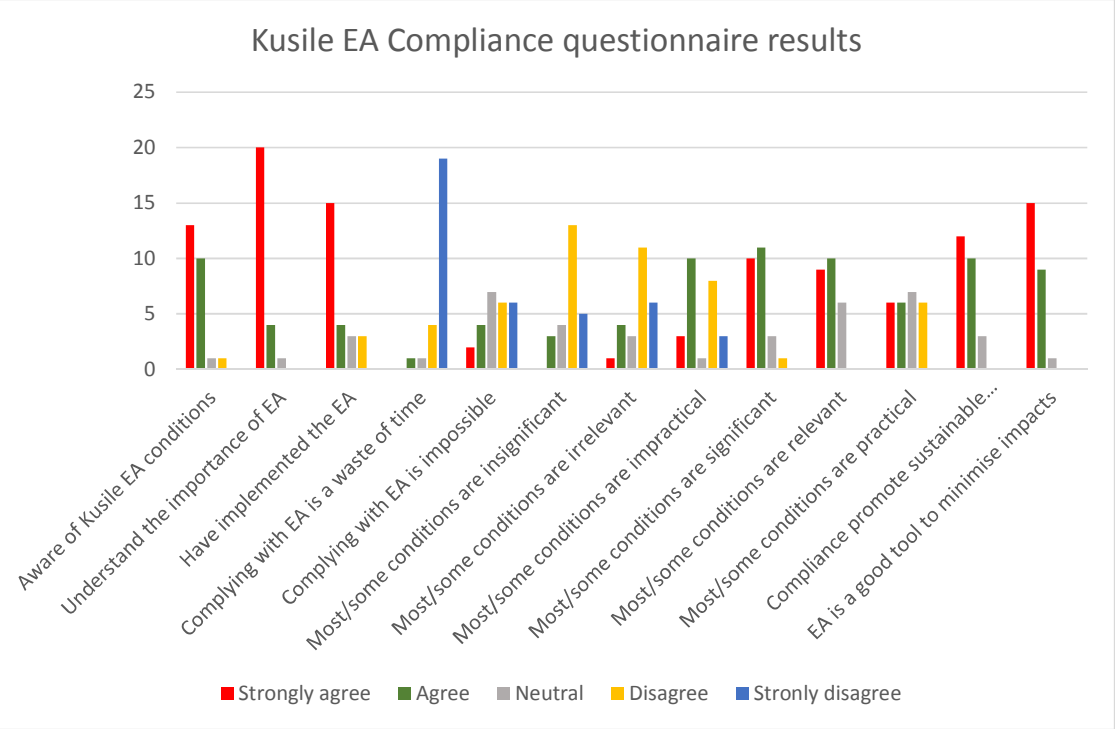


Figure 4.10 Results of the Kusile questionnaire participants

There were however varied responses regarding whether it is impossible to comply with all the EA conditions. Five (5) participants agreed that it is impossible, twelve (12) disagreed that it is impossible and eight (8) were neutral on the question. This could mean that only half of the participants see that compliance will all EA condition is possible.

Similar responses were also provided on whether the EA conditions are insignificant, irrelevant and impractical versus the conditions to be significant, relevant and practical. All participants agreed that the EA conditions are significant and relevant however not all agreed the practicality of the compliance, six (6) participants disagreed on practically whereas nineteen (19) agreed to impractically.

This means that the project implementers clearly understands the importance of the EA towards protecting the environment however find difficulties with implementing

it, as most of them indicated implementing both the EA conditions and EMP requirements on a daily basis.

There were different further comments provided by the participants, as per Table 4.3 below. Only fourteen (14) participants provided these comments and eleven (11) did not have any further comments.

Table 4.3 - Further comments by Kusile questionnaire participants

Group	Comments
Environmentalists	The developer should understand all conditions of the EA prior to construction commencement. Conditions that are not practical should be communicated to the competent authorities.
	Authorizations for environmental issues need to be communicated to everyone in a sufficient manner to ensure all compliance.
	There is a need for top management commitment and good client or contractor relations
	EAs should be site specific and practical so that it can be implemented across the site.
Engineers	Training, induction and awareness required.
	Environmental impact should always benefits civilization. The benefits of progress should quantitatively be assessed against the environment and sound decision made
	Training and awareness are required so that all parties are involved before an incident occurs. Policies should be looked at to ensure that they are addressing

	practical, real issues and not causing unwanted delays due to formalities.
	The ways in which environmental issues are communicated create a gap. For example, during induction and toolbox talks issues are only highlighted, and the procedures are not well communicated/explained as to where to find them and whom shall be contacted. Have been on site for a year but never saw an environmental policy. Resource utilization like fuel seems to be measured on Eskom properties and not on contractors on the site as well. Environmental system should influence everyone' work. Other than physical impacts on the environment, impacts are on resources utilization as well.
Senior Managers/ Management	Engage with the authorities on receipt of the EA and discuss each condition for a much better understanding and agreement of what is required. As this will eliminate cases of impractical conditions posed on the project and ensure that all conditions are relevantly practical.
	EA should be received as a tool to assist the projects' sustainability commitments. All stakeholders in a project environment should know applicable elements or conditions of the EA to their line of operation. They should further know that non-compliance to any condition of the EA may results in individual criminal prosecutions.
	It is possible to comply with the EA as at the last external audit in February 2015, Kusile got 99% for compliance with the EA. However, not all EA conditions are practical, out of 100 at least 10 is not practical. Kusile has made about 10 amendments applications to DEA to request relaxations to some of the EA

	conditions. And 8 were approved and 2 still awaiting DEA' decision.
Project Managers/ Coordinators	There should be set targets that are achievable to ensure compliance, as impractical targets will not be complied with. The rats are a big problem on site – a catch and kill target should be set than introducing owls or hunting birds.
Ground workers	Humans should respect the environment
	Provide continual awareness to contractors on the importance of complying with the EA and what is expected of them. Furthermore put in stringent actions to address non-compliances.

The comments in Table 4.3 above, indicates that most participants require the EA conditions to be more practical in order to ensure compliance. As a result of non-practical conditions as noted by one of the management personnel, Kusile EA was amended ten (10) times to request relaxation of conditions from DEA.

Other requirements include awareness training to ensure clear understanding of the EA conditions and proper communication with all project implementers throughout the development construction phase. Furthermore, the environment should be protected and all project implementers should be aware that non-compliance to EA conditions may results in individual criminal prosecutions.

4.1.2 Overall implementation of the EA condition at Kusile

Kusile is well informed with the EA conditions and understands the importance of compliance to the EA as is to any other permit or license. More effort was evidenced as the power station alone employed about forty-four environmental personnel dedicated for the project development.

The external audits conducted over the years also indicated a compliance of over 90% compliance throughout. However, very few non-compliances were also identified. The illegal stream diversion remains a concern regarding environmental management. However, it was rectified through a NEMA, Section 24G EIA' application which was approved by DEA and thereafter managed in terms of the authorised EA. The other non-compliance was the excessive removal of vegetation.

4.2 Medupi Power Station case study

Medupi obtained a number of authorizations for its different activities and they are as follows:

- Main power station and associated infrastructure, DEA Ref: 12/12/20/695 (21 September 2006);
- Telecommunication mast, DEA Ref: 12/12/20/1228 (18 Sept 2008);
- Raw water reservoir and associated pipelines, DEA Ref: 12/12/20/1139 (27 October 2008);
- Access roads, DEA Ref: 12/12/20/1179 (6 Nov 2008); and
- Coal stockyard, DEA Ref: 14/12/16/3/3/1/531 (09 July 2012).

The focus for this study is on the compliance for the main power station EA. The construction commenced in early 2007 (Medupi Environmental Manager, 2015).

Environmental structure of Medupi Power station

The power station like Kusile has its own internal environmental department and has further appointed an external environmental consultant which serves as the Environmental Control Officers for the project. The main contractor and all sub-contractors have their own environmental representatives dedicated for Medupi and in total the environmental personnel (including contractors environmental representatives) working on site daily are thirty-five (35), as indicated in Figure 4.11 (Medupi Environmental Manager, 2015).

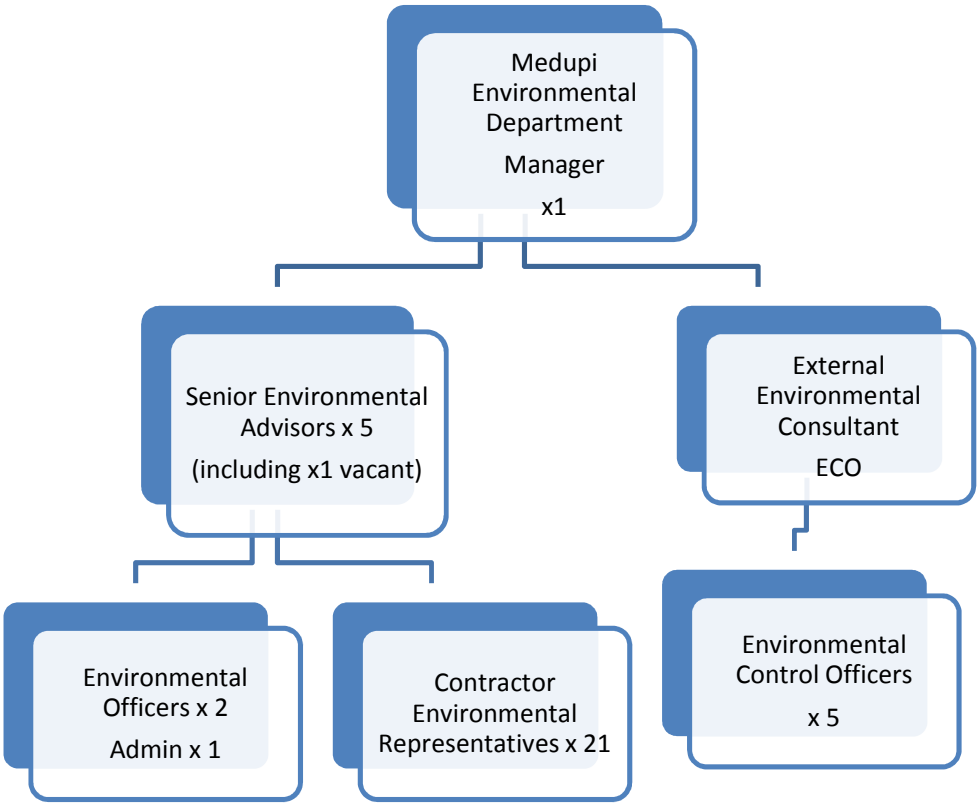


Figure 4.11 Environmental management personal structure of Medupi (Medupi Environmental Manager, 2015)

4.2.1 Results presentation and discussion

The first site visit was conducted at Medupi on 26 February 2015 and follow-up site visits were conducted on the 10 -11 July 2015. The observations made and findings are discussed below.

4.2.1.1 Ash disposal facility

The Medupi Power Station EA condition 3.1 item 8, specifically excluded authorizing the disposal of waste as defined previously in Section 20 of Environment Conservation Act, Act No. 73 of 1989 now Section 2 of National Environmental Management Waste Act, Act No. 59 of 2008. However, it referred the activity to be addressed in a separate application or amendment (Yako, 2006).

A separate EIA was conducted to acquire the waste management license for the ash disposal site which was issued 28 October 2009 with license number 12/9/11/L50/6.

4.2.1.2 Air quality management

EA condition 3.2.1.1 to 3.2.1.5 addresses the requirements for the air quality management at the power station and its surroundings. It indicates that Medupi should initiate a program for the continuous monitoring of ambient concentrations of pollutants in the Marapong human settlement and surrounding areas.

Furthermore, unlike Kusile the EA specifically indicates that Medupi should install commission and operate any required Sulphur dioxide abatement measures that may be necessary to ensure compliance with any applicable emission or ambient air quality standards published in terms of the National Environmental Management: Air Quality Act, (Act No.39 of 2004). Sulphur Dioxide (SO_2), Nitrogen Oxides (NO_x), Carbon Monoxide and trace of emissions of various heavy metals are the most concerned to monitor for, which generally results from the burning of coal (Yako, 2007; Van Schalkwyk, 2008).

Medupi has two ambient air quality monitoring stations installed at the Marapong human settlement and Kroomdraai farm, as indicated with the red pins in Figure 4.12, as Marapong and Medupi air quality monitoring (AQM). The monitoring stations also monitor impact from the nearby Eskom' Matimba Power Station (Matimba) which is also near Lephalale town.

The Kroomdraai monitoring station was installed in October 2014 and is about 5km from Medupi. The Marapong monitoring station was installed as part of the Matimba project and is about 2.4km from Matimba. As Medupi is still under construction, the stations currently monitor the baseline conditions prior to Medupi commissioning. However, it has to be noted that at the time of the site visit of 9 July 2015, Medupi' one unit out of six units was operational since March 2015 for testing phase (Senior Environmental Advisor, 2015).

Medupi also installed and uses the technology of a fabric air filter bags which assist in absorbing and/or reducing air emissions.

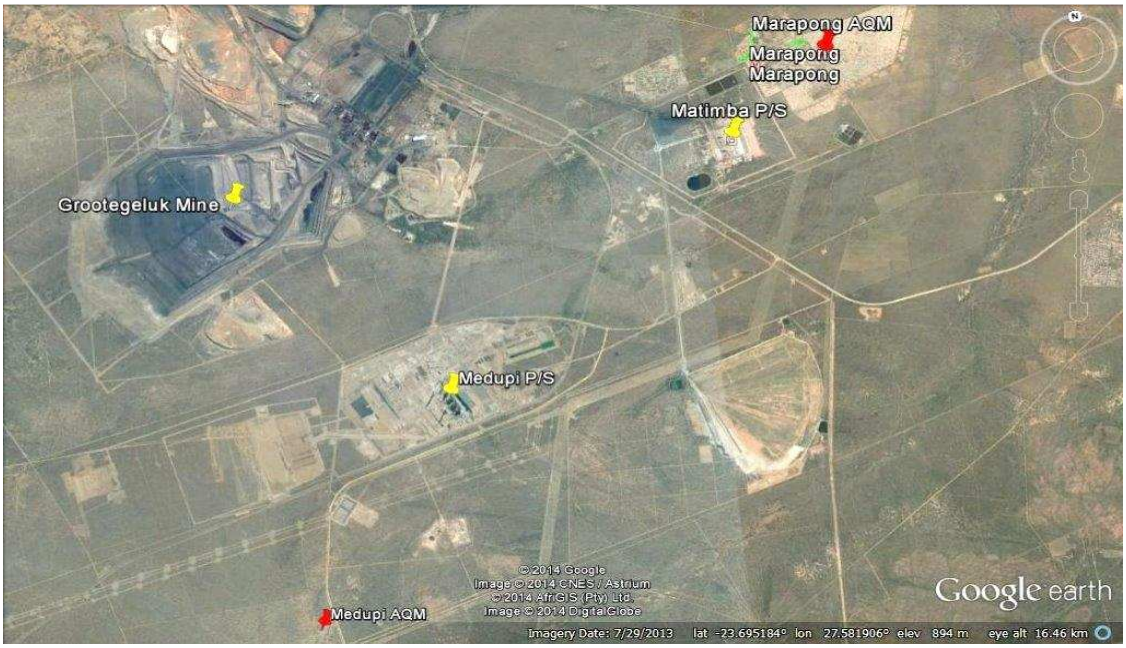


Figure 4.12 Air quality ambient monitoring stations at Marapong human settlement and Kroomdraai farm (Eskom, 2015b).

Figure 4.13 Dust suppression at Medupi

- **Implication to the study purpose**

Medupi has met the requirement of installing an ambient air quality monitoring at Kroomdraai farm to monitor its impacts, as the Marapong monitoring station was already in existence. Additional to the air quality monitoring stations, Medupi has installed bucket dust fallout monitoring points around the power station. It also practices dust suppression to reduce dust blow out, as indicated in Figure 4.13 above.

4.2.1.3 Environmental Monitoring Committee (EMC)

EA condition 3.2.2 requires Medupi to establish the EMC similar to the Kusile as discussed in Section 4.1.1.4 of this Chapter however the Air quality specialist was not required to form part of the EMC member for Medupi. Regardless of the differences in the EMC requirements, the EA required both power stations to install the ambient air quality monitoring stations.

These power stations will utilize the combustion of coal to generate its electricity which will results in the release of emissions to the atmosphere. According to the researcher, the EA requirement to monitor the air quality indicates the need to manage the power stations potential air pollution impacts. The authority had an oversight of not including the air quality specialist to form part of the Medupi EMC.

- **Implication to the study purpose**

The EMC is well represented by all the required members as per the EA conditions. The EMC was established at the Medupi project inception in 2007 and terms of reference drawn in June 2007, attached in Appendix XII. The requirement for the EMC to meet bi-monthly has been changed in consultation with DEA to only meet on every four months (Bower, 2009).

4.2.1.4 Environmental Management Plan (EMP)

EA condition 3.2.3.1 requires Medupi to submit a site specific construction EMP to the relevant authorities for acceptance prior to commencement of any of the

activities related to the issued EA. The construction EMP was submitted to DEA for acceptance and two more revisions afterwards were also accepted by DEA.

- **Implication to the study purpose**

Similar to Kusile, no much emphasise was given for the full detailed compliance of the EMP as the main focus of the study is the compliance with the EA. However, the construction EMP as required by the EA condition was developed and accepted by DEA. And according to the external audits conducted, over 90% of the EMP's are being complied with.

4.2.1.5 Environmental Control Officer (ECO)

EA condition 3.2.4.1 – 3.2.4.7 addresses the requirements for the ECO. It requires the ECO to do the followings:

- EMC to appoint an ECO a month prior construction commencement and authorities to be notified of such an appointment;
- Monitor the project compliance with conditions of the EA, other environmental legislations and the EMP on a daily basis;
- Ensure periodic environmental performance audits are undertaken;
- Submit an environmental compliance report on a bi-monthly basis to DEA and copy provincial Limpopo Department of Economic Development, Environment and Tourism;
- Maintain daily site diary, non-conformance register, public compliant register and audits register; and
- Report to and be accountable to the EMC.

Medupi contracted an external independent ECO company which has five (5) ECOs, as indicated in Figure 4.11 above, dedicated for and based at Medupi project daily to ensure compliance with all environmental permits and/or licenses.

One of the ECOs was interviewed during one of the site visits; it was found that the officer has relevant qualifications that is Bachelor of Science; Honors in Ecology and eight (8) years' work experience in the field of environmental science. Three (3)

years of these work experiences are on Medupi. The officer is clearly knowledgeable on the Medupi project.

- **Implication to the study purpose**

This condition has been fully complied with and it also shows that Medupi have better understanding of the need of compliance with legislation as instead of appointing 1 ECO as required by the EA, 5 ECOs were appointed to equally share the work. This is in relation to the magnitude of the work due to the nature of the construction of a coal-fired power station which normally as explained by Eskom (2014a) takes up to ten (10) years. This is also evident as Medupi commenced early in 2007 and 2015 was its ninth (9) year of construction.

The ECOs submit their combined monthly reports to the Medupi Environmental department and EMC. A daily site dairy of the ECO and non-conformance as well as complaint registers were also seen on site during the site visit. All the ECOs are still employed on site.

4.2.1.6 Monitoring and auditing

Medupi contracted an external independent environmental consultant to conduct bi-annual audits against compliance of all environmental permits and/or license at the power station. This is similar to Kusile however different consultants are been used for each power station. These external audits commenced in 2008 and have been carried out till to date. The ten audits reports which are also submitted to DEA were reviewed from start of audits in 2008 to 2014; the results are indicated on the graph in Figure 4.14.

This graph like Kusile indicates compliance results of over 90% throughout all audits conducted. However, Medupi' compliance is higher than the Kusile where compliance started at 92% in 2008 and went up reaching 100% twice in November 2011 and May 2012. Compliance went slightly down in May 2013 and April 2014 but still above 98%.

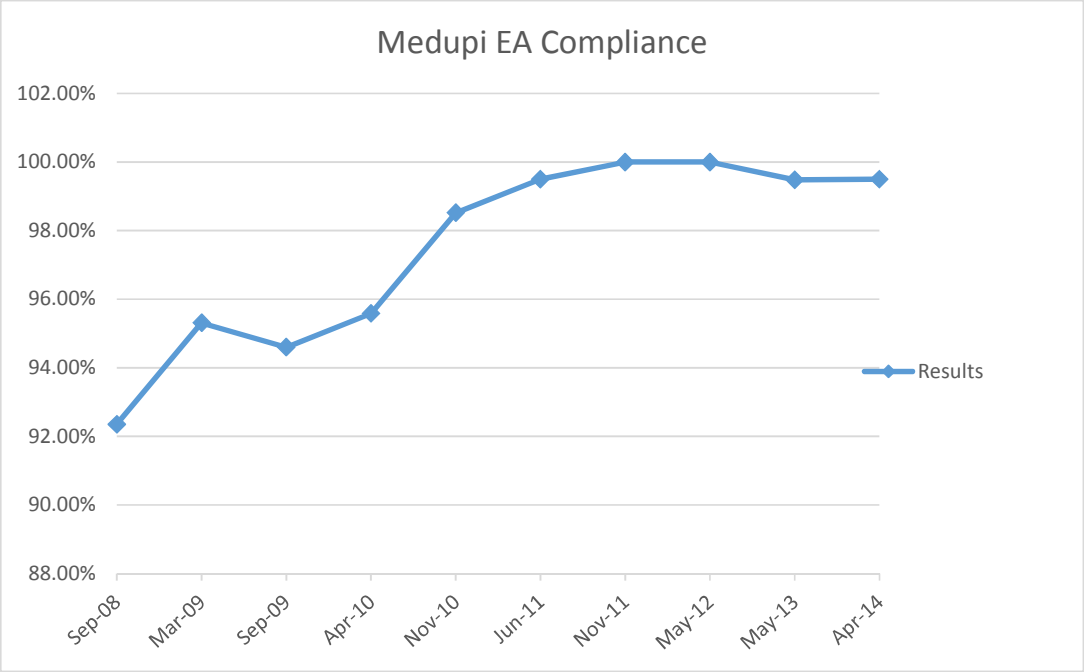


Figure 4.14 Medupi EA and EMP external compliance audits results

- **Implication to the study purpose**

The compliance results indicate that compliance with all EA conditions is possible and that Medupi is complying very well with the conditions. However, the practicality of compliance with certain conditions raised different discussions during the reflection on the questionnaires and will be discussed further in the questionnaire Section 4.2.1.11.

4.2.1.7 Heritage resources

EA condition 3.2.8 states that archaeological remains or resources if exposed during excavations for the purpose of laying foundations, construction should be stopped and an Archaeologist should be called to site for the inspection.

"On the 6th June 2007, after the construction of Medupi has already commenced, an additional grave was located under a tree near the old school building" (Eskom, 2014b). The process of locating the family was initiated and agreements reached to relocate the grave through a formal legal process of obtaining necessary permits. The investigation process enabled the establishment of identifying the deceased

and the grave was relocated to the nearby Maropong human settlement cemetery (Eskom, 2014b).

Eskom (2014b) further mentioned that the discovery of this unmarked grave led to further heritage study or investigations by Eskom through the appointment of the Archaeologist. Subsequently, a number of graves claims by members of the human settlement were received and made in the same year.

According to Medupi Environmental Manager (2015) the heritage study was to, firstly verify whether the heritage assessment conducted during the EIA phase was correct and followed proper processes and legislation in terms of the National Heritage Resources Act, Act No. 25 of 1999.

Secondly, to validate claims of graves in the Medupi project area made by the community as there was no proof of affected graves in previous heritage assessment study conducted for the EIA (Bohlweki Environmental Consulting, 2006). However, further investigation of the site on which the power station is established did not reveal any further graves. Other few identified graves were not affected by the project area (Eskom, 2014b).

- **Implication to the study purpose**

The condition to comply with the heritage resources was fully complied with by Medupi. However, the archaeological remains (the identified grave in this case) was not as a result of the excavations but discovered underneath the tree where construction were to take place. Nevertheless proper processes were followed and necessary permits for the grave relocation acquired.

4.2.1.8 Hazardous materials handling

EA conditions 3.2.6.1 and 3.2.6.2 address the requirements for handling hazardous materials. A project as large as Medupi often involves the usage of hazardous substances and/or materials on a daily basis. During the review of monitoring reports and the conducted site visits, it was observed that hazardous substances are labeled and handled with care, as indicated in Figure 4.15 below. However,

poor storage of hazardous substance was recorded and rectified as per the reviewed incident reports.


(a)


(b)

Figure 4.15 Medupi handling sites (a) Hazardous substance and (b) general waste.

- **Implication to the study purpose**

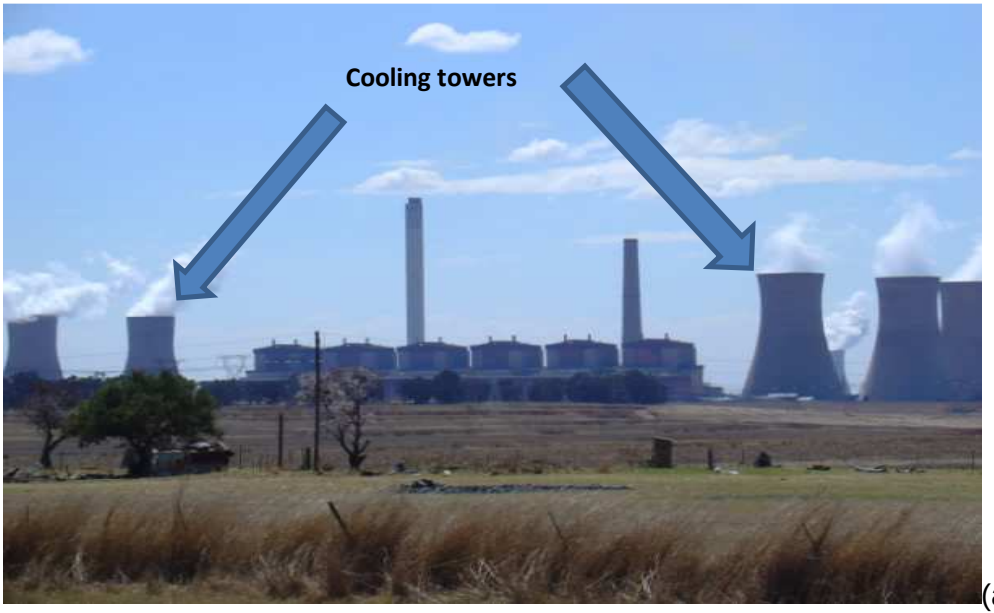
Oil spills incidents had occurred on site and clean-up measures undertaken.

4.2.1.9 Water quality management

EA condition 3.2.9.1 requires Medupi to continuously monitor the ground water quality and implement measures to ensure that pollution of the water resources do

not occur. Medupi established groundwater monitoring in 2007 and conducts quarterly monitoring.

Furthermore Medupi uses air cooled condenser (ACC) for its cooling purposes and not the method of normal wet or dry cooling towers that uses more water. The ACC further reduces visual impact and footprint space usage unlike the normal cooling towers, as indicated in Figure 4.16.



(a)

(b)

Figure 4.16 Power stations cooling structures (a) normal cooling towers structure and (b) Medupi air cooled condenser structure.

- **Implication to the study purpose**

EA condition 3.2.9.1 has been complied with from the initial phase of the project as the monitoring points were installed in 2007, which is the year construction commenced.

4.2.1.10 Flora and fauna management

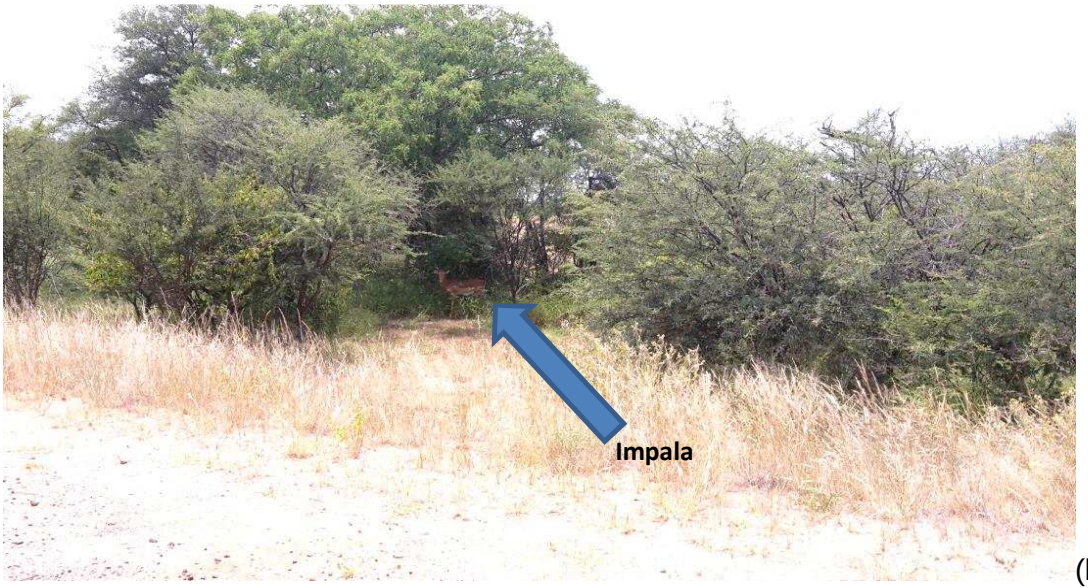
The site visit observation made showed more dense indigenous vegetation cover around the surrounding of the Medupi project area, as indicated in Figure 4.17. The power station has a farm fence which keeps the animals out of the station however smaller animals such as monkeys and snakes still come through. Some vegetation cover has been left un-removed inside the power station and animals are able to roam around freely within the station, as indicated in Figure 4.18. However, fewer incidents where animals were killed had occurred on site.

Figure 4.17 Indigenous vegetation cover in and around Medupi

- **Implication to the study purpose**

It was evident on the observation made during the site visit, that Medupi considered the area' vegetation when the vegetation clearance was undertaken.

(a)



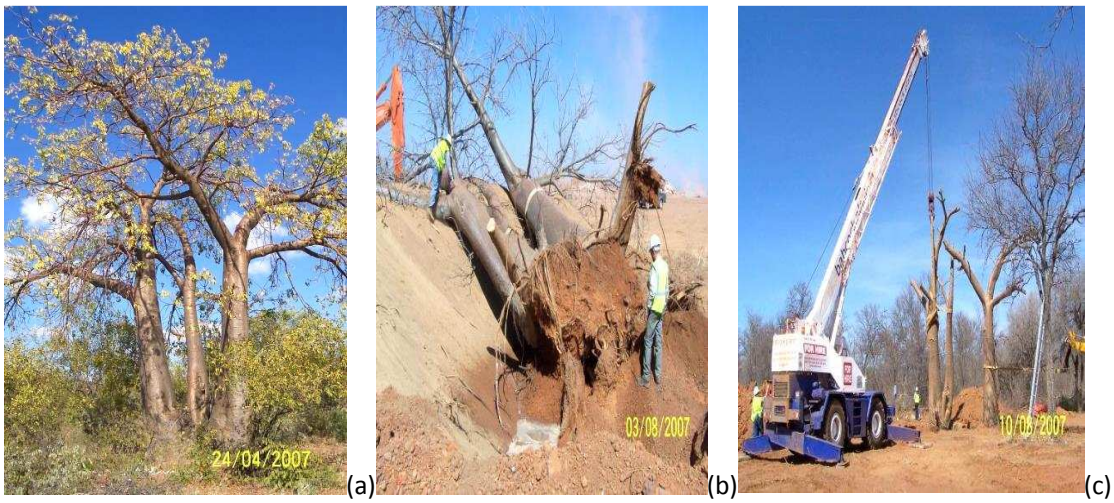
(b)

Figure 4.18 Animals in the Medupi Power Station area (a) Monkey within the power station yard and (b) Impala adjacent the power station yard.

Most of the vegetation cover were left un-removed or undisturbed within the power station area and only removed vegetation on active areas of the development. There has been an observation of monkeys within the power station yard. Generally there is no practical mitigation to prevent smaller animals from coming inside the

station. However caution should be exercised while working around the power station.

EA condition 3.2.8.6 and 3.2.8.9 requires that the provisions of the National Environment Management: Biodiversity Act, Act No. 10 of 2004 should be adhered to and that permit should be obtained for the removal of indigenous trees.



(a) (b) (c)

Figure 4.19 Medupi Baobab trees (a) trees prior to transplanting, (b) trees being transplanted and (c) trees at completion of transplanting (Eskom, 2012b).

Medupi has complied well with this condition by obtaining permits, attached in Appendix XIII, to remove and transplant protected indigenous trees and game, as indicated in Figure 4.19. Vegetation clearance was minimized as some trees such as Baobab were transplanted and others left undisturbed. Some animals were also relocated, as indicated in Figure 4.20.

4.2.1.11 Medupi questionnaire results and discussion

The questionnaire similar to the one completed at Kusile was completed at Medupi by at least twenty-five (25) project implementers or participants over a period of time prior, during and after the site visits, totaling to fifty (50) participants for the two power stations. The number of participants is also similar to Kusile and is described

in Table 3.3 of the previous Chapter 3. A sample of completed questionnaires is attached to this report as Appendix V and VI.

(a) (b) (c) (d)

Figure 4.20 Medupi animals relocation (a) recovered snake, (b) catching of a snake, (c) recovered impala and (d) transporting of recovered animals (Eskom, 2012b).

Similar to Kusile most of the participants were male employees (23 males and 2 females), having between 0 to 5 years of inducement in the development of Medupi. Most of the participants are aware of the Medupi EA, understand the purpose of complying with the EA, and believe that it is not a waste of time, but is a necessary step towards achieving sustainable development. The results of the survey or questionnaire are indicated in a graph on Figure 4.21 below.

Most participants, over twenty (20) participants, indicated that they understand the importance of complying with the EA. They also agreed that complying with EA is not a waste of time. They further agreed that EA is a good tool to use to minimize detrimental impacts and promoting sustainable development.

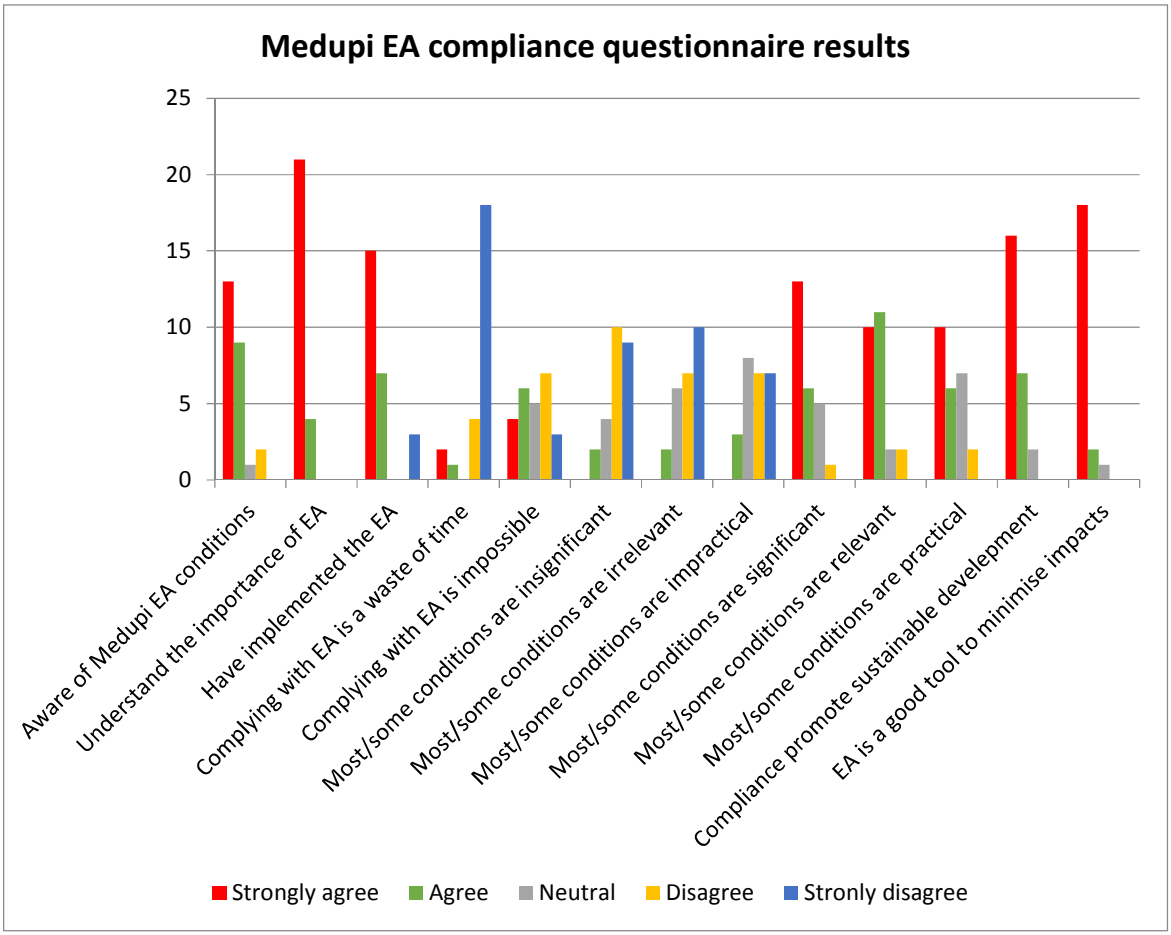


Figure 4.21 Results of the Medupi questionnaire participants

There were however comparable responses regarding whether it is impossible to comply with all the EA conditions. Four (4) participants strongly agreed and six (6) participants agreed that it is impossible however seven (7) disagreed and three (3) strongly disagreed that it is impossible whereas five (5) were neutral on the question.

Similar responses were also provided on whether the EA conditions are insignificant, irrelevant and impractical versus the conditions to be significant,

relevant and practical. Most participants agreed that the EA conditions are significant, relevant and practical.

Similar to Kusile there were different comments provided by the participants and are described in Table 4.4 below, with the key words or comments written in bold. Only sixteen (16) participants provided these comments and nine (9) did not have any further comments.

Table 4.4 - Further comments by Medupi questionnaire participants

Group	Comments
Environmentalists	It is possible but difficult to comply with all the conditions of the EA at all times.
	EAs are legal documents and should be complied with. Where EA conditions are impractical or irrelevant, the developers should follow proper process to request amendments with the competent authorities otherwise comply with all conditions.
	Easier language and the use of local languages will help in the dissemination and understanding of the documents
	Projects of long duration such as Medupi, requires the EA to be revised in accordance with the changing environments and legislation. EIA are often predictions which when applied to construction, the anticipated impacts differs.
Engineers	Issuing of EA should consider the practical and implementable measures.
	EA is a very useful tool and should always be enforced in all projects regardless of sizes. EA trainings and awareness to the project implementers and contractors is necessary to ensure compliance.
	Awareness and training of ground workers on penalties for non-compliance is necessary.
	EA conditions have been made to look impractical, as people have negative attitude towards implementing those conditions contained in EAs.

Senior Managers/ Management	As conditions are based on predictions done during the EIA phase, they are at times not 100% accurate in terms of what actual impacts take place during construction. The construction EMP' continuous updates should be more relevant as well as the environmental practices on site as part of their management system.
	There is often little linkage to the outcome of EIA or BA process, except for a condition referencing the impact report. EA conditions are not cognizance of the specific site determination making implementation of some conditions to be impractical or impossible.
Project Managers/ Coordinators	Continual communication from management.
	All employees should strictly follow and implement the environmental permits and understand the permits.
	Human behavior is a challenge as a result others do not comply with the EA conditions. E.g. Problem of littering.
	The contractor's full participation is essential to the success of the EA. The site environmental and construction team work hard to achieve this but not all contractors have the skills required. Therefore, training of contractor's staff is necessary.
Ground workers	People do not know the importance of waste separation and waste bin labeling as they mix the waste.
	The EA assist in keeping the environment safe and clean. Complying with EMP also assist in audits preparations.
	Trainings are necessary for the ground workers in order for their understanding of the environmental long term impacts of non-compliance and how to prevent potential impacts from occurring.

- **Implication to the study purpose**

The comments above show that more training and awareness of the EA implementation by the project team , particularly the ground workers was required to ensure full compliance by all parties involved with the development. Furthermore,

the impracticality and/or difficulty to comply with all EA conditions were also observed. The comments also show the success or effectiveness of complying with the EA conditions at Medupi.

4.2.2 Overall implementation of the EA condition at Medupi

Medupi like Kusile is well informed with the EA conditions and understands the importance of compliance with the EA as is to any other permit or license. More effort was evidenced as the power station alone employed about thirty-five environmental personnel dedicated for the project development. Also the noticeable and profound handling of the grave relocation, plants and animals' relocations were undertaken.

The external audits conducted over the years also indicated a compliance of over 90% throughout and also reaching 100% compliance in certain periods. This shows commitment towards environmental management.

4.3 Gaps identified

During desktop review, site visits and interview conducted, it was noticed that the EAs did not cover other crucial aspects related to the Kusile and Medupi development as well as taking into account the development areas of Witbank and Lephalale. These missing crucial aspects within the EA are the identified gaps. Identified gaps were addressed in the projects' EMP to some extent; however their significance quantifies them to be included in the EA as well.

4.3.1 Kusile Power Station

4.3.1.1 Storm water and soil erosion management

Kusile has a steep slope in some areas and the surroundings have less vegetation cover. This situation may be a potential trigger for soil erosion and run off water to drain quickly. The EA should have included conditions relating to management of storm water and soil erosion for the good of protecting the environment.

4.3.1.2 Dust suppression

Dust suppression like in Medupi, was not required by the EA, this is required to

reduce the dust blow in a project area especially that Kusile and Medupi are projects that take very long, more than seven (7) years in construction phase.

4.3.1.3 Water resource management

The development area of Kusile has more rivers and wetlands; hence more emphasis was on wetlands management on the EA was necessary. Furthermore, DEA failed to require more clarity on how the wetland would be dealt with as the initial ash disposal facility design submitted with the FEIR covered the wetland area.

4.3.2 Medupi Power Station

4.3.2.1 Air quality management

The EA condition 3.2.1.1 to 3.2.1.5 addresses the requirements for the air quality management at the power station and its surroundings. It indicates that Medupi should initiate a program for the continuous monitoring of ambient concentrations of pollutants in the Marapong human settlement and surrounding areas as already discussed in Section 4.2.1.2.

This condition requirement does not specify the period when to initiate the monitoring program. In comparison with Kusile, monitoring station was installed in 2007 and construction commenced in 2008, whereas in Medupi the monitoring station was installed in 2014 and construction commenced in 2007. However, the Matimba monitoring station installed in Marapong human settlement was used by Medupi since 2007. Monitoring prior to commencement of the construction assist with gathering background data of the area.

In the case of these related case studies, the power stations are not the only once in the vicinity of their location, as other existing similar power stations also owned by Eskom had already installed the required monitoring stations. This makes it easier for continual process of monitoring to cater for new power stations.

However, in a case where this condition may apply to a different project which does not have the existing monitoring stations in place, the condition may be missing enough clarity as developers can choose when to install the monitoring. This can be once the project is operational aiming to monitor the operational impacts, and not necessarily when the project is under construction to monitor baseline conditions of an area. Therefore, the condition needs to specify the period or project phase when the monitoring station should be installed.

4.3.2.2 Noise

During site visit in February 2015, high volume of noise was experienced near and within the plant (electricity generating unit's buildings) construction area. The offices have ear piece plugs, as indicated in Figure 4.22, at each main door. The Senior Environmental Advisor (2015) explained a safety requirement of the power station to always wear ear plugs whenever one is going inside the plant. This is required as part of full personal protective clothing which includes among other things hard hats, reflector jacket, safety shoes, etc.

4.3.2.3 External auditing/monitoring

The EA did not specifically request the monitoring or auditing to be conducted at a specific period rather indicated that records relating to monitoring should be made available for inspection to any relevant authority in respect of the power station development, condition 3.2.5.1 of the EA.

Regular and continuous external audits for a project of enormous magnitude as Medupi are crucial in informing both the developer and the authorities on the compliance of the project against acquired permits and/or licenses. Therefore, the EA condition should be specific to ensure this matter is well addressed by developers.

Figure 4.22 Colorful ear piece plug at Medupi

4.3.2.4 Incidents management

A number of incidents have been recorded such as the cement spills, hydraulic oil and diesel spills, killing &/or dead animals and most of them attended to. However, the EA did not mention how to address the incidents. It has to be known that a project of enormous magnitude as Medupi cannot be expected to have no incidents. Therefore a specific condition on incidents management was necessary to be included in the EA.

4.3.2.5 Dust suppression

Dust suppression was overlooked as no EA condition addressed it and the project of magnitude as Medupi even though selective vegetation clearance was undertaken; most clearance on active project areas is unavoidable. Therefore, dust suppression is necessary to reduce dust blow out.

4.3.2.6 Heritage resources

One grave was identified underneath the tree during initial stages of Medupi construction and it had to be relocated as it was where the main construction of the electricity units' plant should be located.

Improvements are required with specialists who conduct the heritage impact assessments to accurately advise the projects or developments on the actual impacts on heritage resources. This will ensure projects' timeous planning and budgeting for inclusion of possible relocation processes in the main project schedules. Contraventions for not acquiring required permits prior to project execution could be avoided and the mindset change from perspective that environmental management issues delays development processes.

4.3.2.7 Biodiversity management

The development area is within a rich biodiversity area with more indigenous plant and animal species, more emphasise on biodiversity management was necessary by the authorities on the EA.

4.4 Comparison of Similarities

Most of the EA conditions are similar for both of the projects, as indicated in Table 4.5, namely:

- Requirements of the air quality ambient monitoring station;
- Establishment of the Environmental Monitoring Committees (EMC);
- Appointment of the Environmental Control Officer; and
- Compliance with other legislations.

Table 4.5 - Comparison of similarities of EA compliance at Kusile and Medupi Power Stations

Aspect	Kusile Power Station	Medupi Power Station
ECO Both the projects appointed an independent ECO as required by DEA. However, they both appointed more than 1 ECO.	Appointed 2 ECOs to share the work	Appointed 5 ECOs to share the work
EMC Both the projects established the EMCs at project inception phases with all the requirements of the EMC as required by the EA conditions	Commenced construction in 2008 and established EMC in the same year	Commenced construction in 2007 and established EMC in the same year
Air quality management Both installed air quality ambient monitoring stations at the nearby surroundings	Monitoring station installed at Phola human settlement, about 15km from Kusile	Monitoring station installed at Kroomdraai farm, about 5km from Medupi. Also uses the Marapong human settlement monitoring station
Audits Both the projects run a bi-annual external audits	Bi-annual external audits conducted	Bi-annual external audits conducted
Heritage Both the projects affected and relocated heritage resources	Relocated over 50 graves to Phola cemetery in the nearby Phola human settlement and demolished old houses	Relocated 1 grave to Marapong cemetery in the nearby Marapong human settlement

Overall Implication to the study purpose

Most of the EA conditions are very practical and positive as it ensures that impacts are mitigated. The EMC is crucial since all affected and interested stakeholders are fully involved with both developments.

In conclusion, both Kusile and Medupi complied with their EA conditions. They both appointed more than one project ECO to manage the compliance on a daily basis, as well as appointing external auditors to undertake bi-annual compliance audits of the environmental permits and licenses. The environmental incidents that occurred such as the illegal stream diversion at Kusile were rectified through Section 24G of NEMA, EIA rectification application, and it was authorized by DEA. The next Chapter will provide an overall conclusion of the research study and recommendations.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

The presentation of results for both the Kusile and Medupi Power stations against the research question, as in Chapter 1 of this report (also listed below), and results discussions were made in the previous Chapter. This Chapter draws the conclusion from the findings and proposes the recommendations. These conclusions have been structured according to the research aim presented in Chapter 1, Section 1.5.

Main research objectives:

- To determine the effectiveness of implementing and complying with the EA conditions during project construction phase.
- To identify the project challenges for implementing and complying with the EA conditions

Main research questions:

- To determine whether EA conditions ensure that sustainable development is at the forefront of developments that obtained EA's?
- How is the effectiveness of implementing the EA conditions for preventing and minimizing further environmental damage as predicted or identified during the EIA phase of such project?

5.1 Conclusions

5.1.1 The effectiveness of implementing and complying with the EA conditions

The conclusion of the effectiveness of implementing and complying with the EA conditions at Kusile and Medupi project construction phase is discussed below.

Both projects generally showed effectiveness in implementation and compliance to the EA conditions as their compliance status never dropped below 90% compliance. However, the practicality of complying with certain conditions was noted to be challenge. Kusile had non-compliance where a stream was diverted illegally; a Section 24G of NEMA was applied for and approved by DEA.

Kusile's non-compliance findings such as the excessive removal of vegetation, complains of more sediments at the downstream rivers, oil spills incidents; graves relocations were discussed and adequately addressed. The graves relocations followed proper process and acquired permit from SAHRA and oil spills were cleaned-up as well. However, no evidence on dealing with excessive removal of vegetation and complains of sediments in streams, were provided at the time of this research study.

Medupi did not have major non-compliance findings identified during this research study except for the incidents such as oil spills, killing of animals, poor storage of hazardous material and illegal dumping of hazardous substances. However, all the incidents were addressed. Medupi relocated one (1) grave and also like Kusile which relocated more graves about two hundred (200), it followed proper process of acquiring relocation permits.

Nevertheless compliance with most of the EA conditions were met by Kusile and Medupi, such as establishing the Environmental Monitoring Committee, installing an air quality ambient monitoring stations, compliance with the EMP, monitoring of the poultry farm at Kusile, conducting external audits and appointing Environmental Control Officers.

Therefore, it is concluded that the implementation and compliance to EA conditions for both the projects is effective.

5.1.2 Identified projects challenges

The number one challenge identified towards complying with EA conditions is the practicality of complying with certain conditions which resulted in Kusile applying for a number of EA amendments. This was also evident from the results of the questionnaires, as discussed and indicated in Figure 4.12. The problem picked is not the non-possibility to comply but the level of feasibility of implementation or application of those conditions which then determine whether the project is compliant or non-compliant.

The identified projects challenges were discussed in Section 4.3 of this report. Most of them highlighted the gaps identified in the EA conditions. Due to the observations

made on site and findings of the study. Some conditions were supposed to have at least been included and/or emphasised in the EA conditions.

The following were identified as crucial aspects that were supposed to be included in the EA conditions:

- Storm water and soil erosion management at Kusile due to generally less vegetation cover in the area;
- Dust suppression requirements for both the Kusile and Medupi as both the projects take longer time in construction phases;
- Wetlands management at Kusile as the area has rivers and wetlands affected by the project development;
- Noise management at Medupi as the high volume of noise is experienced near and within the plant (electricity generating unit's buildings) construction area;
- External audits requirements for Medupi as the projects of enormous magnitude as Medupi are crucial in informing both the developer and the authorities on the compliance of the project against acquired permits and/or licenses; and
- Biodiversity management at Medupi as the development area is within a rich biodiversity area with more indigenous vegetation and animals.

5.1.3 Sustainable development at the forefront of developments that obtained EA's and minimising environmental damage

To answer the question of whether EA conditions ensure that sustainable development is at the forefront of developments that obtained EA's and minimises environmental damage is a very challenging question on its own. Legally, every development should adhere to a sustainable development project agenda and consider avoiding and/or minimising its environmental damage or footprint.

According to Marshall *et al.,* (2005) EIA has little value unless follow-up is carried out, because without it, the process remains incomplete and the consequences of EIA planning and decision-making will be unknown. Arts *et al.* (2001) further stated that there are questions about how do we know whether some additional action is

needed to prevent unacceptable environmental impacts. And this calls for some follow-up to EIA to keep an eye on the real effects of project.

Youthed (2009) also added that one of the advantages of follow-up is allowing learning from experiences to take place. This means that the EIA follow-up may assist in determining whether the EA conditions, as mostly drawn from the identified impacts of the EIA process, if implemented well could ensure sustainable development thereby minimising environment damage.

This study concludes that on the two case studies used, the EA conditions when well implemented and fully complied with will ensure that sustainable development is at the forefront of developments that obtained those EA's.

5.2 Recommendations

During the study it was discovered that Kusile unlike Medupi had many environmental issues that required careful detailed attention due to the environmental aspects of the surrounding area where the project development is located. These environmental issues needed to be dealt with adequately and timeously to avoid non-compliance. Unfortunately, the project ended up with a non-compliance which led it to apply for a Section 24G of NEMA, Act No. 107 of 1998 to rectify the illegal stream diversion activity.

To ensure that non-compliances do not occur, the whole project team (engineers, environmentalists, project managers, senior managers, ground workers, etc) should work together and be aware of the environmental aspects so that they can be able to identify red flags that could lead to non-compliances in advance and timeously.

The followings are recommended to ensure good implementation and full compliance of the EA conditions:

- The developers should conduct an environmental due diligence study prior to project construction in order to ensure that all environmental related permits and/or licenses were acquired and in place; identify the risks and potential non-compliances that could occur;
- Environmentalists should be involved in all processes of the development at initial stages in order to advise the project on environmental related issues;

- Educate the project team on the environmental issues and importance of compliance to environmental permits and/or licenses; and
- Furthermore, authorities issuing EAs should be encouraged to familiarise themselves with the environmental aspects of the project area of an activity and not use a blanket approach which results in some omission of crucial aspects to address when drawing conditions.

5.3 Final thoughts

The importance of EIA follow-up has been shown by different authors as discussed in this study report. Generally, there is value in conducting an EIA follow-up in order to identify the reality of project implementation against expected impacts as was identified during the EIA process, from which the EA drawn its conditions from.

With this said, it can make a debatable discussions whether the EIA follow-up should be legislated and compulsory for listed activities as is with the BA or EIA processes. And if yes, how the lessons learnt for one development will be shared with another development and whether the development that used those lessons will be required to undergo its EIA follow-up as well.

The thoughts of the researcher based on outcomes of this study, is that EA compliance is achievable for willing developers who understand the need for environmental protection. The authorities also need to firm up their environmental protection role, identified environmental significant impacts of a project should be provided with stringent EA conditions to aid the mitigation of such impacts.

EIA follow-up should be regulated as its outcomes play a crucial role in the EIA project circle. EIA process on its own is not a complete project circle for achieving sustainable development, if the actual impacts of such projects are not known and not adequately managed.

Additional to the authorities' inspections or audits for projects development, EIA follow-ups should be undertaken. Conducting EIA follow-up by authorities will eliminate biasness. Furthermore, environmental management is not about punishing developers but ensuring sustainable development and environmental protection.

The researcher' opinion is that these study results can be applicable to other projects in a way that lessons can be learnt on the following:

- EAs should be adequately studied, well understood and all other related environmental permits or license should be acquired prior to project execution;
- Relevant project stakeholders and management commitment is crucial throughout the project construction phase;
- EA and EMP trainings and awareness should be undertaken by all project implementers;
- Duty of care should be a common practice for environmental management with or without EAs; and
- Authorities should be engaged with throughout the project circle.

REFERENCES

Amarilis L, Casteli F, Gallardo C, Pompeu C, Sofia J, Alves M, Campos O & Yazbek B 2015: Improving effectiveness of mitigation measures in EIA follow-up. *Management of Environmental Quality: An international Journal*. 26, 4, 518-537.

Arts J, Caldwell P & Morrison-Saunders A 2001: Environmental Impact assessment follow-up: good practice and future directions – findings from a workshop at the IAIA 2000 conference. *Impact Assessment and Project Appraisal*. 19, 175-185.

Aucamp PJ 2009: *Environmental Impact Assessment – a practical guide for the discerning practitioner*. Pretoria: Van Schaik.

Bataineh RH 2007: The effectiveness of the Environmental Impact Assessment follow-up with regard to biodiversity in Azerbaijan. *Management of Environmental quality: An international journal.* 18, Issue 5, 591-596.

Bohlweki Environmental Consulting 2006: Medupi Power Station Final Environmental Impact Assessment Report. Johannesburg: Eskom.

Bower N 2009: Medupi Power Station Project: Environmental Monitoring Committee. Report No 8. Lephalale: Eskom.

Brundtland 1987: *The Brundtland Report.* http://www.iisd.org/sd/.

Creswell JW 2009: Research Designs: Qualitative, Quantitative and Mixed methods approaches. (3rd Ed.) Log Angeles: SAGE.

Cubitt JL 2001: An assessment of the status of EIA follow-up in Kwazulu-Natal. Durban: University of Natal.

Department of Environmental Affairs 2016: Biodiversity and conservation. https://www.environment.gov.za/sites/default/files/docs/10yearsreview_biodiversity_conservation.pdf

Department of Water and Sanitation (DWS) 2015: National Water Act: Act No. 36 of 1998. Revision of the pricing strategy for water use charges in terms of Section 56(1) of the National Water Act. 1998.

Environment Conservation Act. No. 73, 1989: Republic of South Africa, Government Gazette, Environmental Impact Assessment Regulations 1182. Pretoria: Government Printer.

Environmental Impact Assessment Regulations. No. R 982, 2014: Republic of South Africa, Government Gazette. Pretoria: Government Printer.

Eskom 2008: Annual Environmental Report. Medupi Power Station.

Eskom 2012a: Kusile Lessons learnt presentation.

Eskom 2012b: Eskom Environmental Management training.

Eskom 2014a: Kusile and Medupi Power Station. http://intranet.eskom.co.za/sites/Generation/Pages/Kusile.aspx.

Eskom 2014b: South African commission for the promotion and protection of the rights of cultural, religious and linguistic communities*: Feedback on Medupi Heritage issues*.

Eskom 2015a: Project Dust Awareness Monitoring.

Eskom 2015b: Research, Testing and Development. Sustainability Division: Medupi Air Quality Monthly Report.

Eskom 2015c: Research, Testing and Development. Sustainability Division: Phola Air Quality Quarterly Report.

Eysenck MW 2004: *Research methods: data analysis*. Pres.

Fuggle RF & Rabie MA 1992: *Environmental management in South A*frica. Cape Town: Juda.

Goodrich-Mahoney JW, Abrahamson LP, Ballard JL & Tikalsky SM 2008: *Environmental concerns in rights of way management.* (8th Ed.) United Kingdom: Elsevier.

Jelena P, Dagnija B, Francesco R & Marika R 2012: Analysis of the Environmental Impact Assessment of power energy projects in Latvia. *Management of Environmental Quality: An international Journal*. 23, 2, 190-203.

Jordaan I 2010: Environmental Impact Assessment follow-up in South Africa: Critical analysis of predictions and compliance for the Mooi River Mall case study. Potchefstroom: North West University.

Kempen E 2015: Procedures for Masters and Doctoral degrees in CAES. UNISA.

Kothari CR 1985: *Research methodology: Methods & techniq*ues. (2nd Ed.) India: Wishwa.

Kusile Environmental Manager 2015: Personal Communication. Environmental Manager of Eskom Kusile Power Station.

Limpopo Department of Economic Development, Environment and Tourism (LEDET) 2004: Limpopo State of the Environment Report.

Marshall R, Arts J & Morrison-Saunders A 2005: International principles for best practice EIA follow-up. *Impact Assessment and Project Appraisal*. 23, 175-181.

Medupi Environmental Manager 2015: Personal Communication. Environmental Manager of Eskom Medupi Power Station.

Morris P & Therivel R 1995: *Methods of Environmental Impact Assessm*ent: The natural and built environment series 2. England: UCL.

Morrison-Saunders A, Marshall R & Arts J 2007: EIA Follow-up International best practice principles. *Special Publication Series No 6*.

Mpumalanga Province 2003: Mpumalanga State of the Environment Report.

Mpumalanga Province Government 2012: The history of the province. http://www.mpumalanga.gov.za/about/history/limpopo/htm.

National Business Initiate 2014: CDP South Africa Water Report.

National Environment Commission 2011: Environmental Management Tools and Techniques: A learning material. Bhutan. UNDP.

National Environmental Management Act. No. 107, 1998: Republic of South Africa, Government Gazette. Cape Town: Government Printer.

National Environmental Management: Biodiversity Act. No. 4, 2004: Republic of South Africa, Government Gazette. Cape Town: Government Printer

National Heritage Resources Act. No. 25, 1999: Republic of South Africa, Government Gazette. Cape Town: Government Printer.

National Water Act. No. 36 1998: Republic of South Africa, Government Gazette. Pretoria: Government Printer.

Ninham Shand Consulting Services 2007: Kusile Power Station Final Environmental Impact Assessment Report. Johannesburg: Eskom.

Rio Declaration 1992: Rio Declaration on the Environment and Development. United Nations.

Senior Environmental Advisor 2015: Personal Communication. Senior Environmental Advisor of Eskom Medupi Power Station.

Senior Environmental Corporate Specialist 2014: Personal Communication. Senior Environmental Corporate Specialist of Eskom Holdings SOC Ltd.

Senior Environmental Corporate Specialist 2015: Personal Communication. Senior Environmental Corporate Specialist of Eskom Holdings SOC Ltd.

South Africa Info 2015: Limpopo Province. South Africa http://www.southafrica.info/about/geography/.

Statistics South Africa 2015: Mid-year Population estimates. Statistical Release P0302. Pretoria.

Constitution of the Republic of South Africa. No.108, 1996: Constitutional law. Cape Town: Government Printer.

Tarr P 2003: *Environmental Impact Assessment in Southern Africa*. Windhoek: SAIEA.

UNISA 2012: Policy on research ethics1. UNISA.

UNISA 2015: Tutorial letter 101/0/2015 (DFENS91): Dissertation module. UNISA.

Van Dyk 2016: Kusile and Medupi Power station locality map. Eskom GIS Department.

Van Schalkwyk J 2006: Heritage Impact Assessment for the proposed new power station: Witbank area. Pretoria: National Cultural History Museum.

Van Schalkwyk M 2008: Record of decision for project reference 12/12/20/807: Construction of the Eskom generation proposed 5400MW coal fired power station: Witbank. Reference No. 12/12/20/807. Pretoria. Department of Environmental Affairs and Tourism.

Water Research Commission 2009: The State of the Water in South Africa: Are we heading for a crisis. The water wheel.

Welford R 1994: Improving corporate Environmental Performance. *Environmental Management and Health*. 5, Issue 2, p 6-10.

Welman JC & Kruger SJ 1999: *Research Methodology for the Business and Administrative Sciences*. Johannesburg: Thomson.

Wood C 2003: *Environmental Impact Assessment: A comparative Review*. England: Longman.

Yako P 2006: Granting of conditional authorization for project reference 12/12/20/695: Construction of the proposed Eskom Holdings limited: Generation division 4800MW coal fired power station and associated infrastructure near Lephalale. Reference No. 12/12/20/695. Pretoria. Department of Environmental Affairs and Tourism.

Yako P 2007: Record of decision for the construction of the Eskom generation proposed 5400MW coal fired power station: Witbank. Reference No. 12/12/20/807. Pretoria. Department of Environmental Affairs and Tourism.

Youthed J G 2009: Assessing and managing the potential for compliance default of applications submitted in terms of South Africa' Environmental Impact Assessment Regulations. Pretoria: UNISA.

Zhang J, Kornov L & Christensen P 2012: Critical factors for EIA implementation: Literature review and research options. *Journal of Environmental Management.* 114, 148-157.

DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND TOURISM

REPUBLIC OF SOUTH AFRICA

FAX COVER SHEET

DATE: 21 September 2006

TO:	Ms. Deidre Herbst
ORGANISATION	**ESKOM**
TEL:	(011) 800 3501
FAX:	(011) 800 5140

FROM:	Noncedo Sabane		
TEL:	012 310 3416	**ROOM NO:**	1005 South Tower
FAX:	012 322 2602		
E-MAIL:	nsabane@deat.gov.za		
NO PAGES:	15 Including fax cover		

SUBJECT:	**Granting of Conditional Authorisation for Project Reference 12/12/20/695 : Construction of the Proposed Eskom Holdings Limited : Generation Division 4800MW Coal Fired Power Station and Associated Infrastructure near Lephalale**

MESSAGE:	Good Morning Deidre, Please find attached the communication from Ms Lize McCourt as agreed. An original Letter will be forwarded by post. Regards, **Noncedo Sabane** DEAT (Department of Environmental Affairs and Tourism) T: (012) 310 3416 **F: (012) 322 2602**

Ref: 12/12/20/695
Tel: (012) 310 3031 **Fax:** (012) 320 7539 **e-mail:** mntene@deat.gov.za
Enquiries: Ms Mosili Ntene

Ms D Herbst
Eskom Holdings Limited: Generation Division
PO Box 1091
JOHANNESBURG
2000

Fax: (011) 800 3501

Dear Ms Herbst

GRANTING OF CONDITIONAL AUTHORISATION FOR PROJECT REFERENCE 12/12/20/695: CONSTRUCTION OF THE PROPOSED ESKOM HOLDINGS LIMITED: GENERATION DIVISION 4800MW COAL FIRED POWER STATION AND ASSOCIATED INFRASTRUCTURE NEAR LEPHALALE

Please find attached the record of decision in respect of your application for authorisation in terms of Regulations R1182 and R1183 (as amended) promulgated under sections 21, 22, 26 and 28 of the Environment Conservation Act (Act 73 of 1989).

Yours sincerely

Ms Pam Yako
Director-General
Department of Environmental Affairs and Tourism

Date: 21/09/06.

CC: Ms Ashlea Strong Bohlweki Environmental Fax: (011) 466 3841

RECORD OF DECISION FOR PROJECT REFERENCE 12/12/20/695: CONSTRUCTION OF THE PROPOSED ESKOM GENERATION 4800MW COAL FIRED POWER STATION, NEAR LEPHALALE

By virtue of the power delegated by the Minister in terms of section 33(1) Environment Conservation Act, (Act 73 of 1989) ("the Act"), I hereby, in terms of section 22(3) of the Act, authorise Eskom Generation to undertake the activities specified/ detailed below subject to the indicated conditions.

1. DESCRIPTION, EXTENT AND LOCATION OF THE ACTIVITY:

As illustrated in the site layout Plan in Appendix A of the Final Environmental Impact Report dated 22 May 2006 the proposed development entails the following:

- The construction of a 4800MW coal fired power station near Lephalale, on approximately 700ha of the farm Naauwontkomen 509 LQ
- The installation of ancillary infrastructure including the ashing facility on 500-1000ha of the farm Eenzaamheid 687 LQ
- The construction of a conveyor belt for coal supply on the eastern alignment
- The re-routing of the Steenbokpan Road to the northern alternative
- The construction of the overland ash conveyor belt

2. KEY FACTORS INFORMING THE DECISION:

2.1 In reaching its decision in respect of the application, the Department of Environmental Affairs and Tourism ("the Department") has taken, *inter alia,* the following into consideration:

a) The information contained in the:
- Final Scoping Report dated
- Final Environmental Impact Assessment Report dated 22 May 2006.
- Specialist Reports contained in the Final Environmental Impact Assessment Report.
- Addendum to the Final Environmental Impact Assessment Report dated June 2006.
- Comments on the Environmental Impact Assessment Report dated 18 July 2006 from the Department of Water Affairs and Forestry (DWAF).
- Minutes of the meeting held on 10 May 1982 in the office of the Chief Officer (Air Pollution Control) between Eskom and the Department of Health to discuss the Pollution Control conditions related to Eskom's power stations and related matters.

b) Compliance with applicable international and national legislation and departmental policies:
- The Act
- The principles set out in Section 2 of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA)
- Process 29 set out in the Scheduled processes under the Second Schedule to the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965).
- The principles of sound management of toxic chemical set out in Chapter 19 of Agenda 21
- Minimum requirements for landfills by the Department of Water Affairs and Forestry (second edition, 1998)
- Stockholm Convention

c) The findings of the site inspection undertaken by Mr Vincent Matabane and Mr Ndhivhuwo Netshilaphala on 6th April 2005

d) The objections from MW De Jager Kinder Trust/Landelani Game Lodge & MW De Jager Safaris set out in the letter dated 2nd August 2006 from Ivan Pauw & Partners to Bohlweki Environmental Consultants in Midrand.

2.2 In reviewing this information, the Department made the following findings:

- The existing Matimba Power Station is a dry cooled, coal fired pulverised fuel power station comprising six 665 MW units, representing a total nominal capacity of 3990 MW and a total net maximum generation capacity of 3690 MW
- The proposed power station is a dry cooled, coal fired pulverised fuel power station will have a generation capacity of 4800 MW
- Existing sources of atmospheric emission which occur in the vicinity of the proposed development sites include:
  - Existing Matimba Power Station and its associated ash dump
  - Grootgeluk coal mining operations
  - Brickworks operating at Hanglip
  - Household fuel combustion
  - Potential veld fires
  - Sewage works (Farm Nelsonkop)
  - Wind blown dust from areas and agricultural activities
  - Vehicle exhaust releases and road dust entertainment along paved and unpaved roads in the area
- The proposed power station is approximately 3 Km away from the existing Matimba Power Station and the Marapong Village
- The existing Matimba Power Station does not have SO_2 and NO_2 abatement measures in place
- The burning of coal in the proposed power station will potentially release significant amounts of air pollutants such as Sulphur Dioxide (SO_2), Nitrogen oxides (NO_x), Carbon Monoxide (CO), and trace amounts of mercury.
  Ambient SO_2 levels resulting from the new power station are predicted to cause health effects in the Marapong residential area
  The proposed power station will potentially release significant amounts of greenhouse gases, namely, Carbon Dioxide (CO_2) and Nitrous Oxide (N_2O).
- Ambient SO_2 standards are already being exceeded in the area where the new power station is proposed.
- Ambient air quality standards in the Marapong residential area are already being exceeded
- The proposed development will result in a loss of approximately 1 500 hectares of vegetation due to the required pre construction site clearing.
- Approximately 1000 ha of the above are intended for facility for disposal / storage of ash. A conventional ash dam has been proposed and assessed but mention is made of investigations into alternatives to this disposal option, including backfilling at the Grootegeluk open cast coal mine. The investigation of alternatives in this regard has not sufficiently progressed to allow for an informed decision with regard to ash disposal / storage at this stage. It is however acknowledged that an ashing facility will be required.
  The proposed development is part of Eskom's new capacity installation programme and is intended to meet the future base load electricity demands of South Africa which is under severe pressure.

The purpose of the proposed power station is to increase the Eskom Generation base load capacity to facilitate the forecast increase in demand by 2010 and to further supply this additional capacity in such a way that it improves security of supply to the national grid system and South Africa in its entirety.

Based on the information considered, the Department's conclusions are that:
(a.) the proposed activities may lead to substantial detrimental impact on the environment;
(b.) the need for the project have been adequately demonstrated;
(c.) the activities will result in some socio-economic benefits, not only to the Lephalale area, but to the country as a whole;
(d.) the implementation of the mitigation measures and conditions set out in this Record of Decision, are considered adequate to minimise detrimental impacts to acceptable levels;
(e.) subject to successful implementation of conditions and mitigation measures, the proposed development is likely to be acceptable; and
(f.) the principles of section 2 of NEMA can largely be upheld.

It is further the Department's conclusion that further information on alternatives for the disposal of ash produced by the facility is required before an informed decision can be made on this aspect of the application.

The Department has accordingly decided to grant Eskom Holdings Limited: Generation Division authorisation in terms of Regulations R 1182 and R 1183 (as amended), promulgated under section 21, 22 and 26 of the Environment Conservation Act (Act 73 of 1989) for the activities specified below, subject to the conditions and provisions listed below.

3. CONDITIONS

3.1 Description of the activity

The authorisation applies in respect of the following activities as listed in Schedule 1, regulation R. 1182 and described in the final environmental impact report dated 22 May 2006 and the addendum report to the final environmental impact report dated June 2006:

Item 1: The construction, erection or upgrading of-
- (a) facilities for commercial electricity generation with an output of at least 10 megawatts and infrastructure for bulk supply;
- (c) with regard to any substance which is dangerous or hazardous and is controlled by national legislation-
  - (i) infrastructure, excluding road and rails, for the transportation of any such substance; and
  - (ii) manufacturing, storage, handling, treatment or processing facilities for any such substance;
- (d) roads, railways, airfields and associated structures;
- (n) sewerage treatment plants and associated infrastructure;

Item 2: The change of land use from-
- (c): agricultural or zoned undetermined use or an equivalent zoning to any other land use.

Item 9: Scheduled processes listed in the Second Schedule to the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965). (Process 29 (a) – Power Generation Processes in which fuel is burned for the generation of electricity for distribution to the public or for purposes of public transport).

The following activity applied for is not included in this authorisation and will be addressed in an amended or supplementary record of decision:

Item 8: The disposal of waste as defined in section 20 of the Act, excluding domestic waste, but including the establishment, expansion, upgrading or closure of facilities for all waste, ashes and building rubble

The decision contemplated above will be based on the review of the investigation and assessment of alternative ash disposal options to be submitted to the Department for consideration.

3.2 SPECIFIC CONDITIONS

3.2.1 Air quality management

3.2.1.1 Eskom must initiate a programme for the continuous monitoring of ambient concentrations of pollutants in the Marapong residential area as well as surrounding areas around the proposed power station and existing Matimba power station. This programme must be included in the construction EMP and the operational EMP to be submitted to the authorities for acceptance prior to construction, commissioning and operation of the power station. The programme must, among others, detail the installation of air quality monitoring equipment at an appropriate location within the Marapong residential area. The site for the air quality monitoring equipment should be such that the monitored ambient air represents a fair reflection of the ambient air the majority of Marapong residents are likely to breathe. The air quality monitoring equipment must be such as to provide continuous measurement of the following substances or mixtures of substances: Sulphur Dioxide (SO_2); Nitrogen Dioxide (NO_2); Carbon Monoxide (CO); Particulate Matter (PM10 and PM 2.5); Ozone (O_3); and Mercury (Hg).

The installation should also include gas-sampling systems as appropriate for the parameters being monitored, meteorological equipment and data management systems that will allow the effective and reliable transfer of data. The programme must also detail the compilation of a commissioning report produced by an independent party indicating that the installations are in place, calibrated and operating to internationally acceptable standards of operation. The programme must also detail reporting procedures including, among others, the submission of quarterly reports to the department detailing the monitoring results obtained from the installation detailed above and any other monitoring results from Eskom monitoring stations in the area. The monitoring reports must provide, but are not limited to the provision of, both a numeric and graphical representation of measured concentrations of the measured pollutants with a comparison against any applicable ambient air quality standards published in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004). This information should include detailed information for the 3 month period to which the report relates as well as a summary of historical trends from the commencement of monitoring activities.

3.2.1.2 Eskom shall install, commission and operate any required SO_2 abatement measures that may be necessary to ensure compliance with any applicable emission or ambient air quality standards published in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004).

3.2.1.3 Notwithstanding the measures referred to in 3.2.8.2, should the monitoring referred to in 3.2.8.1 indicate non-compliance with ambient SO_2 standards, Eskom shall install, commission and operate any required SO_2 abatement measures in respect of the existing Matimba Power Station as may be necessary to ensure compliance with any applicable emission or ambient air quality standards published in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004).

3.2.1.4 Eskom must initiate a programme of support for initiatives aimed at improving air quality in the Marapong residential area. This programme must be included in the construction EMP and carried through to the operational EMP.

3.2.1.5 The power station must be operated in compliance with any related Registration Certificate issued in terms of the Atmospheric Pollution Prevention Act, Act 45 of 1965, or any related Atmospheric Emission License issued in terms of the National Environment Management: Air Quality Act, Act 39 of 2004

3.2.2 Environmental Monitoring Committee (EMC)

3.2.2.1 This development is authorised on condition that the developer establishes an EMC with clear terms of reference as described in 3.2.2.6.

3.2.2.2 Amongst others the EMC shall consist of the following members:

(a) A chairperson as described in 3.2.2.3,
(b) The ecologist that participated in the EIA process, or any other suitably qualified and experienced ecologist approved for this purpose by the department,
(c) Two representatives of the public, one community member from Marapong and one from Lephalale.
(d) Environmental Control Officer (ECO) (once appointed in terms of 3.2.4 below), and
(e) A senior site manager from the main contractor.

3.2.2.3 The EMC must appoint an independent chairperson who has appropriate people and project management skills.

3.2.2.4 The EMC must meet on a bi-monthly basis from the inception of the project.

3.2.2.5 The EMC must report to the Director-General of the Department of Environmental Affairs and Tourism on a bi–monthly basis and the report must include matters as described in 3.2.2.6 below.

3.2.2.6 The purpose of the EMC is to execute the following:

(a) To monitor and audit project compliance to the conditions of this record of decision, environmental legislation and specific mitigation requirements as stipulated in the environmental impact report and the Environmental Management Plans.
(b) To make recommendations to the Director-General on issues related to the monitoring and auditing of the project.

(c) The EMC shall decide on the frequency of meetings should a need arise to review the prescribed frequency. This change should be communicated to the department for acceptance.

3.2.2.7 All costs associated with the EMC shall be borne by the applicant. The terms of reference for the EMC must, in addition to the scope of work as detailed in 3.2.2.6, clearly set out roles and responsibilities related to logistical arrangements, administration and financial arrangments associated with the EMC.

3.2.2.8 Upon completion of construction, the role, responsibilities and constitution of the EMC shall be re-considered and re-established with new terms of reference for the operational phase of the development.

3.2.3 Environmental Management Plan (EMP)

3.2.3.1 Eskom must submit a site specific construction EMP to the relevant authorities for acceptance before commencement of any of the activities related to this authorisation. The EMP must include but not be limited to the following aspects:

- Rehabilitation of all areas disturbed during the construction phase of the project excluding those areas where permanent structures are erected.
  Siting and management of construction camps, sanitation, ablution and housing facilities as well as material storage areas used by the contractor. All work areas must be supplied with proper sanitation facilities.
- Management and rehabilitation of access roads to individual construction areas that will not become permanent roads upon completion of construction. Any new road constructed for any purpose not authorised as part of this authorisation, must comply with the relevant SANS codes and permission for construction must be obtained from DEAT as required by Schedule 1, item 1 (d) of R. 1182.
  Waste avoidance, minimisation and disposal of waste at an appropriate facility.
  Protection of any heritage sites likely to be impacted by the development should such sites be found during any phase of the project to follow.
- Provisions for harvesting of any medicinal plants that may occur on site prior to site clearance.
- Protection of indigenous vegetation where such is not affected by the physical footprint of the power station plant or ancillary infrastructure and associated construction works.
- Provision for plant search and rescue of protected and endangered species which should be done before commencement of any construction related activity.
  Management of traffic during the construction phase of the development where the site access roads and other transportation networks intersect.
  Measurement, monitoring and management of noise and dust pollution levels during the construction phase.
- A fire control management plan for implementation on site.
- Implementation of site specific erosion and sediment and dust control measures during the construction phase of the project.
  Insofar as it relates to the activities hereby approved, all recommendations and mitigation measures as proposed in the final environmental impact report dated 22 May 2006 and the

addendum report to the final environmental impact report dated June 2006 forms part of this record of decision and must be implemented as part of the EMP.

- All relevant requirements emanating from 3.2.1 above.

3.2.3.2 Once accepted by DEAT, the revised construction EMP will be seen as a dynamic document. However, any changes to the EMP, must be submitted to DEAT for acceptance before such changes could be effected. Such a submission for consideration by DEAT must be accompanied by recommendations of the EMC.

3.2.3.3 Compliance with the accepted construction EMP must form part of all tender documentation for all contractors working on the project and must be endorsed contractually.

3.2.3.4 Eskom must submit an EMP for the operational phase of the development to DEAT and other relevant provincial and local authorities for acceptance prior to the completion of construction phase and the inception of the operational phase of the development. The revised operational EMP will be seen as a dynamic document. However, any substantial changes to the operational EMP, which is environmentally defendable, must be submitted to DEAT for acceptance before such changes could be effected.

Environmental Control Officer (ECO)

3.2.4.1 The EMC in conjunction with the developer must appoint a suitably qualified Environmental Control Officer (ECO) who would on behalf of the EMC, on a daily basis monitor the project compliance with conditions of the record of decision, environmental legislation and recommendations of the EMP. The cost of the ECO shall be borne by the applicant.

The ECO must be appointed one month before the start of construction and the authorities must be notified of such an appointment for communication purposes.

3.2.4.3 The ECO shall ensure that periodic environmental performance audits are undertaken on the project implementation.

3.2.4.4 The ECO shall submit an environmental compliance report on a two-monthly basis, in writing, to the Director-General of the Department of Environmental Affairs and Tourism (DEAT), copied to the Limpopo Department of Economic Development, Environment and Tourism.

3.2.4.5 The ECO shall maintain the following on site:

- A daily site diary
- A non-conformance register
- A public complaint register
  A register of audits

3.2.4.6 The ECO shall remain employed until all rehabilitation measures, as required for implementation due to construction damage, are completed and the site is handed over to Eskom by the contractor for operation.

3.2.4.7 The ECO shall report to and be accountable to the EMC.

Monitoring and auditing

3.2.5.1 Records relating to monitoring and auditing must be made available for inspection to any relevant authority in respect of this development.

3.2.5.2 This department reserves the right to monitor and audit the development throughout its full life cycle to ensure that it complies with the conditions stipulated in the record of decision as well as mitigation measures in the final environmental impact report dated 22 May 2006, the addendum report to the final environmental impact report and the construction and operational EMPs.

Transportation and handling of hazardous materials.

3.2.6.1 During the construction of the power station, an effective monitoring system must be put in place to ensure safety and to detect any leakage or spillage of coolants from all oil containing equipment during transportation, their handling and installation.

3.2.6.2 The transportation and handling of hazardous substances must comply with all the provisions of the Hazardous Substances Act, (Act No.15 of 1973), associated regulations as well as SABS 0228 and SABS 0229 codes.

Rehabilitation after construction

3.2.7. No exotic plant species may be used for rehabilitation purposes. Only indigenous plants may be utilised.

3.2.7.2 Measures aimed at controlling invasive plant species and weeds must be implemented and must form part of the relevant EMP.

3.2.7.3 No disturbance of the land at any stream or rivers edge is allowed unless such disturbance complies with legislation and conforms to strict design parameters.

Compliance with other legislation

3.2.8. Archaeological remains, artificial features and structures older than 60 years are protected by the National Heritage Resources Act, 1999 (Act No. 25 of 1999). Should any archaeological artefacts be exposed during excavation for the purpose of laying foundations, construction in the vicinity of the finding must be stopped. An archaeologist must be called to the site for inspection. Under no circumstances shall any artefacts be destroyed or removed from the site. The South African Heritage Resource Agency must be contacted to this effect. Their recommendations should be included in the construction EMP and be adhered to.

3.2.8.2 All provisions of the Occupational Health and Safety Act, 85 of 1993, and any other applicable legislation must be adhered to by the holder of this authorisation.

3.2.8 3 All provisions of the National Water Act, Act 36 of 1998, must be adhered to by the holder of this authorisation.

3.2.8 4 All provisions of the National Environment Management: Air Quality Act, Act 39 of 2004, must be adhered to by the holder of this authorisation.

3.2.8 5 All provisions of the Atmospheric Pollution Prevention Act, Act 45 of 1965, must be adhered to by the holder of this authorisation.

3.2.8.6 All provisions of the National Environment Management: Biodiversity Act, Act 10 of 2004, must be adhered to by the holder of this authorisation.

3.2.8.7 Should fill material be required for any purpose, the use of borrow pits must comply with the provisions of the Minerals and Petroleum Resources Development Act, 28 of 2002 administered by the Department of Minerals and Energy.

3.2.8.9 A permit shall be obtained from the provincial department of nature conservation for the removal of indigenous protected and endangered plant and animal species.

Water quality management

3.2.9.1 Eskom shall continuously monitor the ground water quality and implement measures to ensure that pollution of the resource does not occur. The monitoring programme for water quality and measures to control and prevent pollution of the resource shall be included in the operational EMP.

3.3 GENERAL CONDITIONS

This authorisation is granted only in terms of section 22 of the Environment Conservation Act,1989 (Act No.73 of 1989) and does not exempt the holder thereof from compliance with any other legislation.

This authorisation refers only to the activities as specified and described in the final environmental impact report dated 22 May 2006 and the addendum report to the final environmental impact report dated June 2006. Any other activity listed under section 21 of the Environment Conservation Act, 1989 (No. 73 of 1989) which is not specified above, is not covered by this authorisation, and must therefore comply with the requirements of the Environment Conservation Act, Government Notice R 1182 and R.1183 (as amended).

This authorisation is subject to the approval of the relevant local authorities in terms of any legislation administered by those authorities.

The applicant must, within 7 (seven) calendar days of receipt of this record of decision inform all interested and affected parties and at least include the following:

(i) That an authorisation has been issued to the applicant to proceed with the construction and operation of the activity. If requested, provide copies of this ROD.

(ii) That any appeals against the issuing of the authorisation must be lodged with the Minister of Environmental Affairs and Tourism within 30 (thirty) days from the date on which this ROD has been issued to the applicant at the address stipulated in this ROD.

(iii) That an appeal questionnaire may be used in the lodging of an appeal. It is obtainable from the Department's offices at tel. (012) 310 3590 or e-mail: cveeden@deat.gov.za.

(iv) The date on which the ROD was issued to the applicant in terms of regulation 10(1) and the date by which appeals must reach the Minister.

Failure to inform interested and affected parties within the stipulated time period may result in the Minister considering requests from such parties for permission to submit a late appeal favourably.

One week's written notice must be given to this Department before commencement of construction activities. Such notice shall make clear reference to the site location details and reference number given above.

One week's written notice must be given to this Department before commencement of operation activities. Such notice shall make clear reference to the site location details and reference number given above.

The applicant shall be responsible for ensuring compliance with the conditions contained in this ROD by any person acting on his behalf, including but not limited to, an agent, servant, or employee or any person rendering a service to the applicant in respect of the activity, including but not limited to, contractors and consultants.

The applicant must notify the Department in writing, within 24 (twenty four) hours if any condition of this authorisation cannot, or is not, adhered to. The notification must be supplemented with reasons for non-compliance.

A copy of the authorisation and ROD shall be available on site during construction and all staff, contractors and sub-contractors shall be familiar with or be made aware of the contents of this authorisation and ROD.

3.3.10 Compliance/non-compliance records must be kept and shall be made available on request from the authorities within five days of receipt of the request.

3.3.11 Any changes to, or deviations from, the project description set out in this letter must be approved, in writing, by the Department before such changes or deviations may be effected. In assessing whether to grant such approval or not, the Department may request such information as it deems necessary to evaluate the significance and impacts of such changes or deviations.

3.3.12 This Department may review the conditions contained in this letter from time to time and may, by notice in writing to the applicant, amend, add or remove a condition.

3.3.15 In the event that the predicted impacts exceed the significance as predicted by the independent consultant in the final environmental impact report and appendices dated 22 May 2006 and the addendum report to the final environmental impact report dated June 2006, the authorisation may be withdrawn after proper procedures have been followed.

In the event of any dispute concerning the significance of a particular impact, the opinion of the Department of Environmental Affairs and Tourism (DEAT) in respect of its significance will prevail.

The applicant must notify the Department, in writing, at least 10 (ten) days prior to the change of ownership, project developer or the alienation of any similar rights for the activity described in this letter. The applicant must furnish a copy of this document to the new owner, developer or person to whom the rights accrue and inform the new owner, developer or person to whom the rights accrue that the conditions contained herein are binding on them.

3.3.16 Where any of the applicant's contact details change, including the name of the responsible person, the physical or postal address and/or telephonic details, the applicant must notify the Department as soon as the new details become known to the applicant.

3.3.17 National government, provincial government, local authorities or committees appointed in terms of the conditions of this application or any other public authority or authorisation shall not be held responsible for any damages or losses suffered by the applicant or his successor in title in any instance where construction or operation subsequent to construction be temporarily or permanently stopped for reasons of non-compliance by the applicant with the conditions of approval as set out in this document or any other subsequent document emanating from these conditions of approval.

If any condition imposed in terms of this authorisation is not complied with, the authorisation may be withdrawn after 30 days written notice to the applicant in terms of section 22(4) of the Environment Conservation Act, 1989 (Act No. 73 of 1989).

3.3.19 Failure to comply with any of these conditions shall also be regarded as an offence and may be dealt with in terms of sections 29, 30 and 31 of the Environment Conservation Act, 1989 (Act No. 73 of 1989), as well as any other appropriate legal mechanisms.

The applicant shall be responsible for all costs necessary to comply with the above conditions unless otherwise specified.

Any complaint from the public during construction must be attended to as soon as possible to the satisfaction of the parties concerned. A complaints register must be kept up to date and shall be produced upon request.

Departmental officials shall be given access to the properties earmarked for construction activities for the purpose of assessing and/or monitoring compliance with the conditions contained in this document at all reasonable times.

3.3.23 All outdoor advertising associated with this activity, whether on or off the property concerned, must comply with the South African Manual for Outdoor Advertising Control (SAMOAC) available from this Department.

3.4 DURATION OF AUTHORISATION

If the activity authorised by this letter does not commence within 4 (four) years from the date of signature of this letter, the authorisation will lapse and the applicant will need to reapply for exemption or authorisation in terms of the above legislation or any amendments thereto or any subsequent new legislation.

4. CONSEQUENCES OF NON-COMPLIANCE

The applicant must comply with the conditions set out in this letter. Failure to comply with any of the above conditions may result in, *inter alia,* the Department withdrawing the authorisation, issuing directives to address the non-compliance – including an order to cease the activity – as well as instituting criminal and/or civil proceedings to enforce compliance.

5. APPEALS

Appeals in respect of this decision must be lodged with the Minister of Environmental Affairs and Tourism within 30 (thirty) days of the date of this decision. Appeals can be submitted utilising one of the following methods:

By facsimile:	(012) 322 0082
By post:	Private Bag X447, Pretoria 0001
By hand:	2nd Floor, Fedsure Forum Building, North Tower, cor. Van der Walt and Pretorius Streets, Pretoria.

Appeals must comply with the provisions of Regulation 11 of Government Notice No. R. 1183 which reads as follows:
"An appeal to the Minister or provincial authority under section 35(3) of the Act must be done in writing within 30 days from the date on which the ROD was issued to the applicant in terms of regulation 10(1);
An appeal must set out all the facts as well as the grounds of appeal, and must be accompanied by all relevant documents or copies of them which are certified as true by a commissioner of oaths."

An appeal questionnaire may be used in the lodging of an appeal. It is obtainable from the Department's offices at tel. (012) 310 3590 or e-mail: cveeden@deat.gov.za.

Should the applicant wish to appeal any aspect of this decision, the applicant must notify and furnish copies of the appeal which will be submitted to the Minister, to all registered interested and affected parties. Proof of such notification must be submitted to the Minister with the appeal. Failure to comply with this provision may result in the Minister refusing to consider the appeal.

6. APPLICANT:

Eskom Holdings Limited: Generation Division
P O Box 1091
JOHANNESBURG
2000

Contact person: Ms Deirdre Herbst

Tel: (011) 800 3501

Fax: (011) 800 5140

7. CONSULTANT:

Bohlweki Environmental (Pty) Ltd
P O Box 11784
VORNA VALLEY
1686

Contact person: Ms Ashlea Strong

Tel: (011) 466 3841

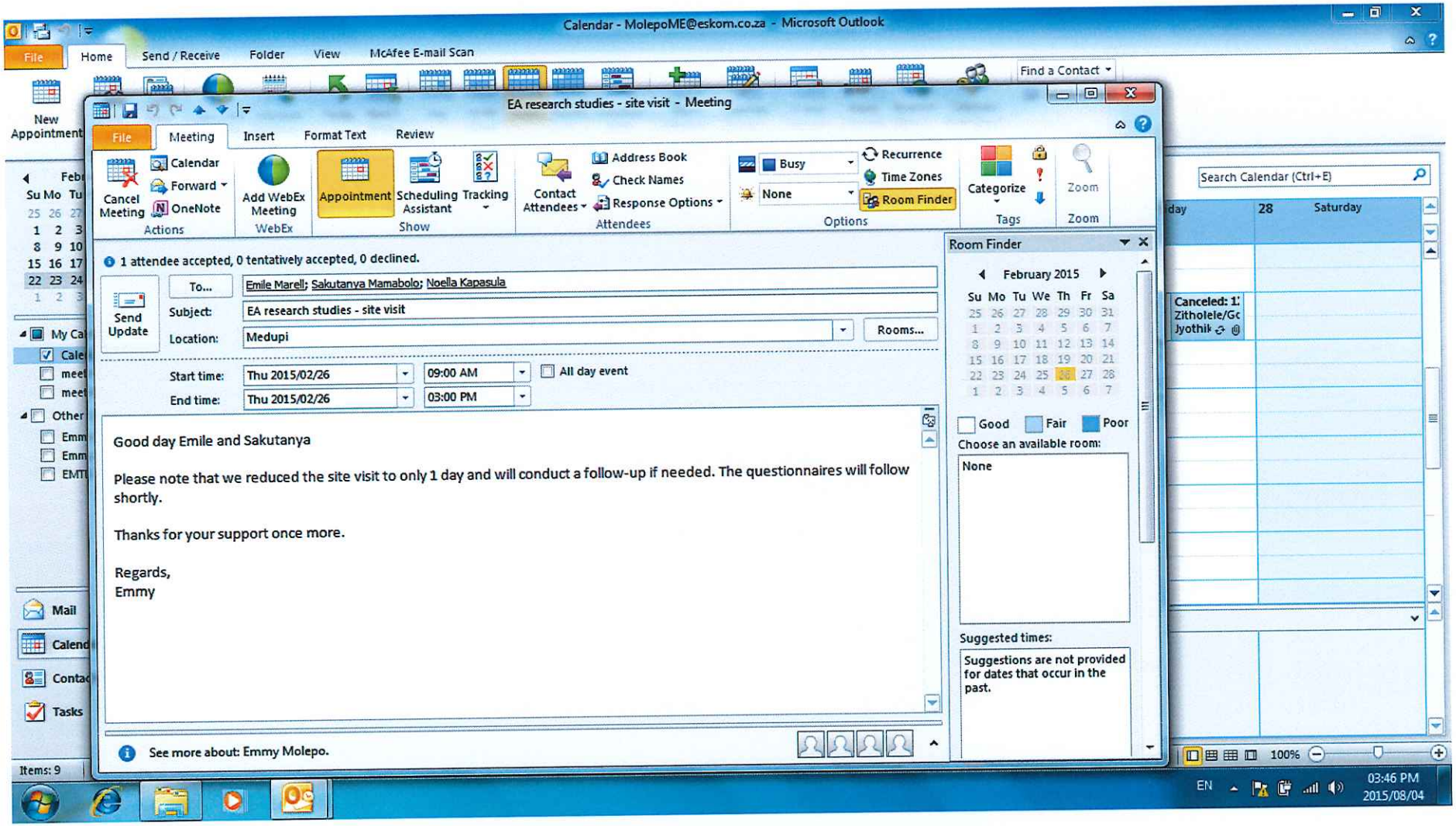
Fax: (011) 466 3849

8. SITE VISIT

A site visit was undertaken by Mr Vincent Matabane and Mr Ndhivhuwo Netshilaphala from the department, Eskom personnel and the consultant on 6th April 2005.

Ms Pam Yako
Director – General
Department of Environmental Affairs and Tourism

Date: 21/09/06


Calendar - MolepoME@eskom.co.za - Microsoft Outlook
File
Home
Send / Receive
Folder
View
McAfee E-mail Scan
Find a Contact
New Appointment
EA research studies - site visit - Meeting
File
Meeting
Insert
Format Text
Review
Cancel Meeting
Calendar
Forward
OneNote
Actions
Add WebEx Meeting
WebEx
Appointment
Scheduling Assistant
Tracking
Show
Contact Attendees
Address Book
Check Names
Response Options
Attendees
Busy
None
Recurrence
Time Zones
Room Finder
Options
Categorize
Tags
Zoom
Zoom
1 attendee accepted, 0 tentatively accepted, 0 declined.
Send Update
To...
Emile Marell; Sakutanya Mamabolo; Noella Kapasula
Subject:
EA research studies - site visit
Location:
Medupi
Rooms...
Start time:
Thu 2015/02/26
09:00 AM
All day event
End time:
Thu 2015/02/26
03:00 PM
Good day Emile and Sakutanya
Please note that we reduced the site visit to only 1 day and will conduct a follow-up if needed. The questionnaires will follow shortly.
Thanks for your support once more.
Regards,
Emmy
See more about: Emmy Molepo.
Room Finder
February 2015
Su Mo Tu We Th Fr Sa
Good
Fair
Poor
Choose an available room:
None
Suggested times:
Suggestions are not provided for dates that occur in the past.
Search Calendar (Ctrl+E)
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Saturday
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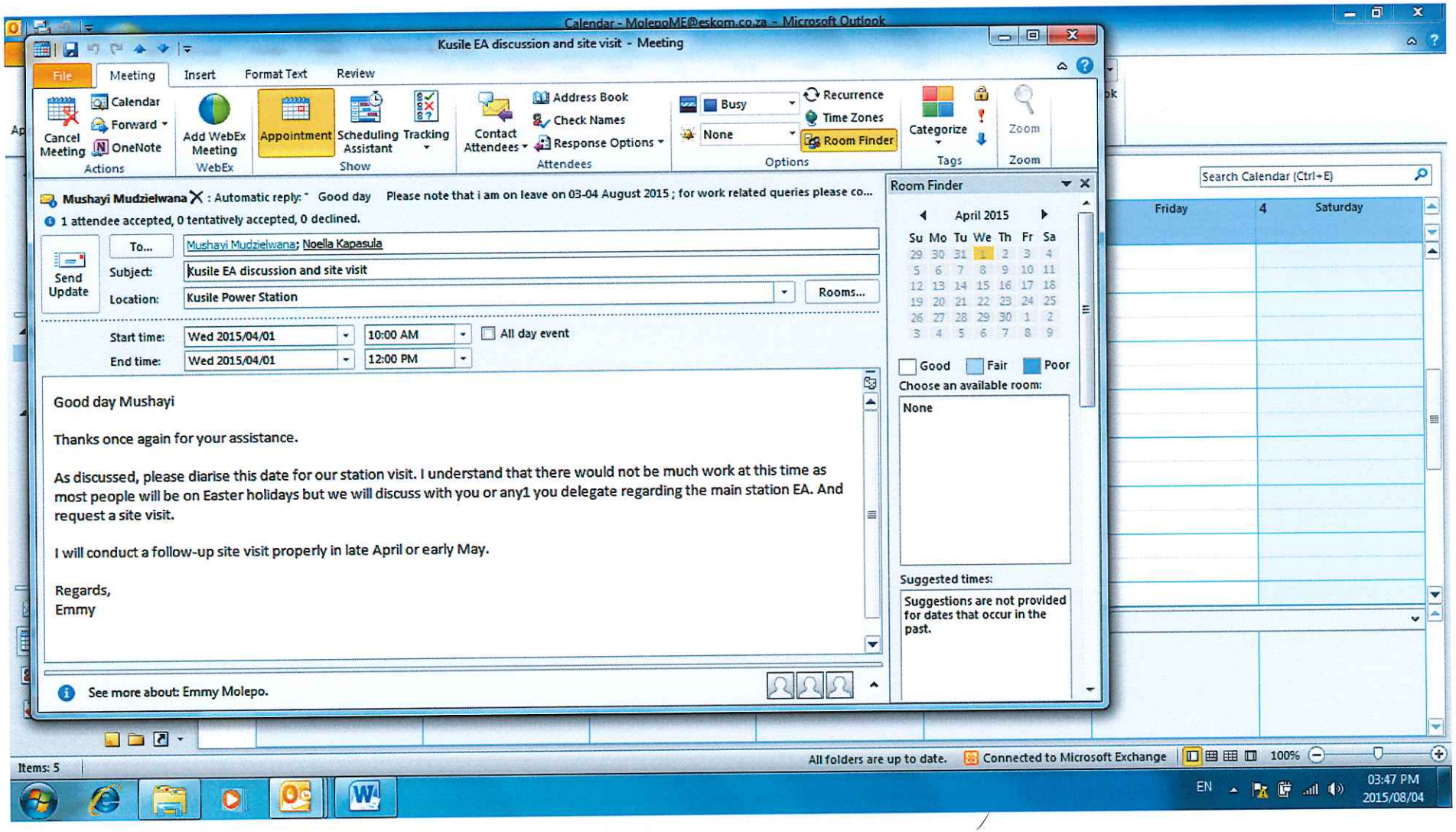
Calendar - MolepoME@eskom.co.za - Microsoft Outlook
Kusile EA discussion and site visit - Meeting
File
Meeting
Insert
Format Text
Review
Cancel Meeting
Calendar
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OneNote
Actions
Add WebEx Meeting
WebEx
Appointment
Scheduling Assistant
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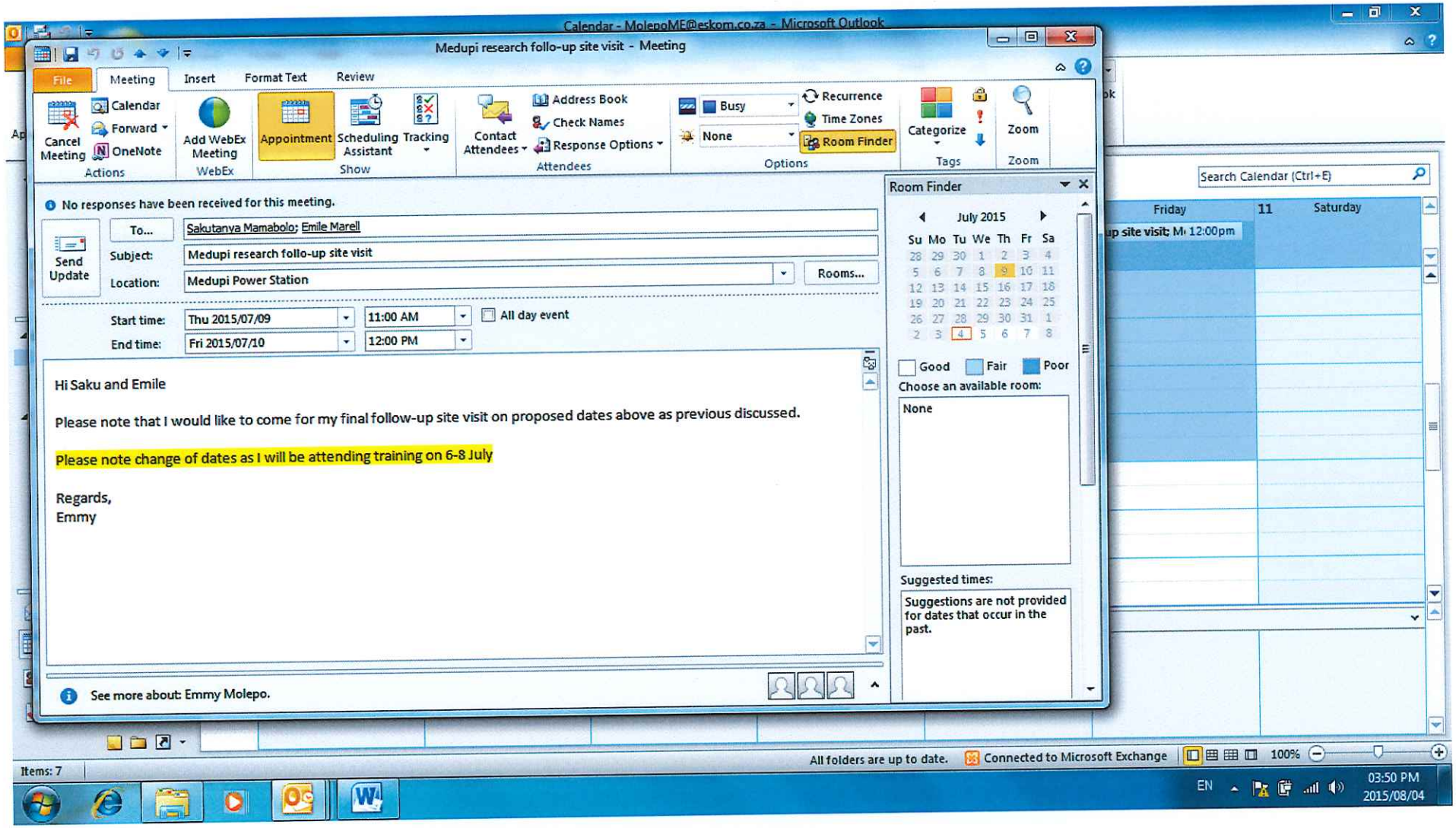
Contact Attendees
Address Book
Check Names
Response Options
Attendees
Busy
None
Recurrence
Time Zones
Room Finder
Options
Categorize
Tags
Zoom
Zoom
Mushayi Mudzielwana : Automatic reply: Good day Please note that i am on leave on 03-04 August 2015 ; for work related queries please co...
1 attendee accepted, 0 tentatively accepted, 0 declined.
Send Update
To...
Mushayi Mudzielwana; Noella Kapasula
Subject:
Kusile EA discussion and site visit
Location:
Kusile Power Station
Rooms...
Start time:
Wed 2015/04/01
10:00 AM
All day event
End time:
Wed 2015/04/01
12:00 PM
Good day Mushayi
Thanks once again for your assistance.
As discussed, please diarise this date for our station visit. I understand that there would not be much work at this time as most people will be on Easter holidays but we will discuss with you or any1 you delegate regarding the main station EA. And request a site visit.
I will conduct a follow-up site visit properly in late April or early May.
Regards,
Emmy
See more about: Emmy Molepo.
Room Finder
April 2015
Su Mo Tu We Th Fr Sa
29 30 31 1 2 3 4
5 6 7 8 9 10 11
12 13 14 15 16 17 18
19 20 21 22 23 24 25
26 27 28 29 30 1 2
3 4 5 6 7 8 9
Good
Fair
Poor
Choose an available room:
None
Suggested times:
Suggestions are not provided for dates that occur in the past.
Search Calendar (Ctrl+E)
Friday
4
Saturday
Items: 5
All folders are up to date.
Connected to Microsoft Exchange
100%
EN
03:47 PM
2015/08/04


Calendar - MolepoME@eskom.co.za - Microsoft Outlook
Medupi research follo-up site visit - Meeting
File
Meeting
Insert
Format Text
Review
Cancel Meeting
Calendar
Forward
OneNote
Actions
Add WebEx Meeting
WebEx
Appointment
Scheduling Assistant
Tracking
Show
Contact Attendees
Address Book
Check Names
Response Options
Attendees
Busy
None
Recurrence
Time Zones
Room Finder
Options
Categorize
Tags
Zoom
Zoom
No responses have been received for this meeting.
Send Update
To...
Sakutanya Mamabolo; Emile Marell
Subject:
Medupi research follo-up site visit
Location:
Medupi Power Station
Rooms...
Start time:
Thu 2015/07/09
11:00 AM
All day event
End time:
Fri 2015/07/10
12:00 PM
Hi Saku and Emile
Please note that I would like to come for my final follow-up site visit on proposed dates above as previous discussed.
Please note change of dates as I will be attending training on 6-8 July
Regards,
Emmy
See more about: Emmy Molepo.
Room Finder
July 2015
Su Mo Tu We Th Fr Sa
28 29 30 1 2 3 4
5 6 7 8 9 10 11
12 13 14 15 16 17 18
19 20 21 22 23 24 25
26 27 28 29 30 31 1
2 3 4 5 6 7 8
Good
Fair
Poor
Choose an available room:
None
Suggested times:
Suggestions are not provided for dates that occur in the past.
Search Calendar (Ctrl+E)
Friday
11
Saturday
Items: 7
All folders are up to date.
Connected to Microsoft Exchange
100%
EN
03:50 PM
2015/08/04

Emmy Molepo

From: Mendy Nemanashi
Sent: 29 July 2015 01:28 PM
To: Emmy Molepo; Mushayi Mudzielwana
Subject: RE: Site visit to Kusile

Hi Emmy

Kindly note as well that tomorrow is PLA,It will be successful to interview contractors before 12.

-----Original Message-----
From: Emmy Molepo
Sent: 29 July 2015 11:26 AM
To: Mushayi Mudzielwana; Mendy Nemanashi
Subject: RE: Site visit to Kusile

Many thanks Mendy and Mushayi

I will come tomorrow at 08:00 as discussed. Please find the attached questionnaire.

-----Original Message-----
From: Mushayi Mudzielwana
Sent: 29 July 2015 09:57 AM
To: Emmy Molepo; Mendy Nemanashi
Subject: RE: Site visit to Kusile

Hi Mendy

Emmy is doing a follow up visit, from the one she did with you previously, please see her request below if you can assist her

She need an hour at most

Mushayi

-----Original Message-----
From: Miranda Moahlodi
Sent: 29 July 2015 09:46 AM
To: Mushayi Mudzielwana
Subject: RE: Site visit to Kusile

Hi Mushayi,

I don't see issues with this, so visit is allowed.

Regards
Miranda

Safety, Health & Environmental Department
R545 Kendal/Balmoral Rd Haartebeesfontein Farm Witbank Kusile Power Station Project
Tel: +27 13 699 7585
Fax: +27 86 668 9747

-----Original Message-----
From: Mushayi Mudzielwana
Sent: 29 July 2015 08:30 AM
To: Miranda Moahlodi
Subject: FW: Site visit to Kusile

Hi Miranda

Please see request from Emmy (GX) and advice

Mushayi

-----Original Message-----
From: Emmy Molepo
Sent: 28 July 2015 03:43 PM
To: Mushayi Mudzielwana
Subject: FW: Site visit to Kusile

Good day Ms Mudzielwana

As discussed with you early today, could I please come visit the station probably on Thursday, 30 July 2015 (between 08:00 - 09:00).

The visit is regarding the finalising of the questionnaires for my environmental studies.

Please note that the questionnaire is very short with 9 questions, it can be completed any how - sitting, working, breaks times, one-on-one, groups, etc. As mentioned I have done the same for Medupi as well and it took 5 -10 min. It can be done in different groups to save more time and limit it to 5min.

I am kindly requesting to see the followings personnel:

- Any x7 ground workers - any general work
- X 5 Supervisor / project coordinator/ project managers
- X 5 Environmentalist
- X5 Engineers
- X 2 Senior/Middle mangers

Participants are requested to fill in the consent form (I will send this 1 pager tomorrow) - just to indicate willingness to participate without been forced, and have right to withdraw anytime they need.

Your assistance is highly appreciated.

Regards,
Emmy

QUESTIONNAIRE

PURPOSE: TO OBTAIN THE UNDERSTANDING OF COMPLYING WITH THE EA CONDITIONS BY THE PROJECT IMPLEMENTERS AT ESKOM'S KUSILE AND MEDUPI POWER STATIONS CONSTRUCTION PHASES

NATURE AND PURPOSE OF THE STUDY

The research study focuses on the effectiveness of implementing environmental authorisations by Medupi and Kusile Power Stations on their construction phases. The environmental authorisations (EA) are issued to project developments to ensure that environmental impacts as identified during the EIA process are avoided and/or minimized at both project construction and operational phases. The EA set out conditions which the development has to comply with to protect the environment for promoting sustainable development. The reason for this research is to determine the effectiveness of complying with the EA of these power stations.

Section A: PROFILE

1. Gender (Please indicate your choice with an "X").

Male	Female

2. Number of years at Kusile Power Station, construction site.

0 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7

What function do you currently perform?

- Environmentalist
- Engineer
- Project Manager/Coordinator
- Senior Manager / Management

- Ground worker

SECTION B: QUESTIONS

The following set of questions describes your general perception towards the Environmental Authorisation conditions for Kusile Power Station. For each question, please indicate to which extent you agree or disagree. Please indicate your choice with an "X".

What is your perception towards the Environmental Authorisation conditions for Kusile power station? Please indicate your choice with an "X".	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. Are you aware of the Environmental Authorisation conditions for Kusile?					
2. Do you understand the purpose and importance of compliance to Environmental Authorisation conditions					
3. Have you implemented the Environmental Authorisation?					
4. Complying with Environmental Authorisation is waste of time					
5. It is impossible to comply with all the conditions of the Environmental Authorisation					
6. Most/some of the Environmental Authorisation conditions are - insignificant,					
- irrelevant and					
- impractical					

7. All of the Environmental Authorisation conditions are - significant					
- relevant, and					
- practical					
8. Complying with all Environmental Authorisation conditions will promote/ensure sustainable development					
9. Environmental Authorisation is a good tool to ensure that project detrimental impacts are avoided and/or minimised					
Kindly provide a detailed suggestion or comment that you think may be useful towards compliance with Environmental Authorisation.					

THANK YOU

PROJECT BRAVO POWER STATION
DRAFT TERMS OF REFERENCE FOR THE ENVIRONMENTAL MONITORING COMMITTEE

1. Establishment and scope of the Committee

The Environmental Monitoring Committee (Committee) is established in terms of the requirements of Subclause 3.2.11 of Record of Decision (RoD) issued by the Department of Environmental Affairs and Tourism (DEAT) for the Project Bravo Power Station. The Committee shall confine its mandate to activities directly related to Project Bravo Power Station and associated infrastructure, as indicated in:

- The Environmental Impact report (EIA, *Report No.: 4284/401281*);
- The Construction Environmental Management Plan (CEMP, *Report No.: 4446/401281*);
- The Record of Decision (RoD, DEAT Reference: R12/12/20/807); and
- The Minister's decision on the appeals (DEAT Reference: R12/12/20/807).

2. Guiding principles of the Committee

2.1 All discussions relating to the tasks and functions of the Committee shall be transparent.
2.2 All parties within the Committee shall act in an accountable and responsible manner in the deliberations of the tasks arising from the process.
2.3 All proceedings of the Committee shall be recorded and be made accessible to the public.
2.4 All parties shall have access to information relating to the work of the Committee to facilitate decision-making.
2.5 Good faith and common understanding shall underline all proceedings within the Committee.
2.6 All matters relating to the Committee shall be addressed with the necessary urgency.
2.7 Any conflict of interest/duties in terms of the role on the Committee with the development or future related developments shall be declared by members of the Committee.

3. Role, purpose and aims of the Committee

3.1 The Committee has an advisory, monitoring and '*watch-dog*' role.
3.2 The Committee will actively participate in the compliance monitoring of Eskom's adherence to the conditions specified in the RoD and implementation of the approved EMPs by reviewing audit reports (prepared by the Environmental Control Officer) and conducting site inspections.
3.3 The purpose and functions of the Committee are to monitor the development with reference to:

3.3.1 The management of the site during construction (in accordance with the EIR, CEMP, RoD, Appeal decision and any subsequent requirements specified by DEAT) to ensure minimal impact on the environment.

3.3.2 The management of the site during operation (in accordance with the Operational Environmental Management Plan) to ensure minimal impact on the environment.

3.3.3 The environmental standard of activities on the site.

3.3.4 The degree of nuisance and/or health hazard caused or likely to be caused to the neighbouring communities.

3.3.5 The degree to which the biophysical environment is impacted upon, and when necessary, propose, discuss and recommend appropriate mitigation measures.

3.3.6 The effectiveness of mitigation measures proposed in the EIR, EMPs and RoD.

3.4 To inform relevant authorities of non-compliance by Eskom with the conditions of the ROD, by submitting a report when there are non-compliances on a regular basis (as agreed to by the Committee and Eskom).

3.5 To promote environmental awareness and capacity building with regards to Project Bravo that shall strive to improve the understanding of surrounding communities and generate interest to keep abreast with future developments of the port.

3.6 To promote a sustainable social and physical environment through responsible management procedures, future rehabilitation and informed monitoring of the site.

3.7 To disseminate information to the various constituencies of the organisations present on the Committee.

3.9 To develop trust amongst the participants and interested and affected parties.

3.10 To evaluate Eskom's complaints procedure and channels of communication with the public on an ongoing basis.

4. Composition of the Committee

4.1 Members nominated to serve on the Committee must have a direct interest/ involvement in the project.

4.2 The Committee shall include the following mandated sectors:

- Proponent (Eskom, both with regard to over project management and site supervision);
- Authorities (DEAT, MDALA, DWAF, District Municipality, Local Municipality),
- Community (inclusive of NGO's, CBO's and the business sector)
- ECO; and
- Specialists (ecologist and air quality specialist).

4.2 To ensure a workable committee, the Committee shall not comprise of more than 25 representatives including authorities, the proponent, the ECO and the various specialists. Should the need arise for more representatives to be appointed, the Chairperson of the Committee has the discretion to do so in consultation with the Committee members.

4.3 Any member may appoint a *secundus* from the same organization to represent him/ her at a Committee meeting by notifying the Chairperson/Secretariat in advance.

4.4 Observer status shall be afforded to anyone wishing to attend any meeting on condition that the Chairperson/Secretariat is informed well in advance of this intention. Observers shall be given limited speaking rights.

4.5 The quorum shall be 60% of the membership of the Committee. A quorum shall require that representatives of all three sectors (Proponent, Authorities and Community) are present.

4.6 In the event of any of the Committee members or their appointed representatives not being able to attend a meeting, prior notification within a reasonable period shall be provided to the Chairperson/Secretariat in writing to allow the meeting to be postponed with a reasonable period of notification thereafter, should this be required. At that postponed meeting, those members present shall constitute the quorum.

5. Membership requirements

5.1 Members shall be nominated by their representing organization or constituency and appointed in writing by their respective organizations to serve on the Committee.

5.2 Members of the Committee shall be disqualified; if they or their appointed representatives are absent for three (3) consecutive meetings of the Committee. Should a representative no longer qualify for membership, the organization he/she represented will be invited to nominate a new representative.

5.3 A member may resign at any time from the Committee by submitting his/ her resignation in writing via to the Chairperson. Once a resignation has been accepted, the organization he/she represented will be invited to nominate a new representative.

6. Decision making procedures within the Committee

6.1 Where possible issues shall be debated until consensus is reached.

6.2 Where consensus cannot be reached, the issues of disagreement shall be recorded in writing and referred to the respective authorities who have jurisdiction over the relevant matters for consideration.

7. Meetings

7.1 The Committee shall meet once every two months or at such intervals as a majority of the members may agree, but not less than four (4) times per annum.

7.2 In the event of an unusual incident occurring (relevant to the Committee's scope), any member of the Committee may request an emergency meeting with the Chairperson, the ECO and an Eskom representative.

7.3 The Committee shall deal with the following matters at its regular meetings:

7.3.1 The report of the ECO on compliance with the RoD and CEMP.

7.3.2 Any amendments required to the EMP

7.3.3 Reports or complaints about incidents or related matters received from members of the public.

7.3.4 Issues of concern to the Committee members. Whenever possible, these issues shall be forwarded in writing to the Chairperson/ Secretariat for

inclusion on the agenda, and if answers are needed, shall also be forwarded to the relevant party / parties before the meeting, to facilitate discussion at the meeting.

7.3.5 Report back on relevant meetings held outside of the Committee.

7.3.6 Reports from Eskom about operational and other relevant matters.

8. Chairperson and deputy chairperson

8.1 At the inaugural meeting of the Committee, the Committee members will nominated an independent Chairperson, from within the ranks of the Committee. As per the requirements of the RoD, the Chairperson must posses the appropriate people and project management skills.

8.2 The Committee shall also nominate a Deputy Chairperson at its inaugural meeting, to stand in for the Chairperson should they be unavailable.

8.3 The appointment of the Chairperson may be reviewed annually, and where the there is consensus from the Committee that the Chairperson should be replaced, the existing Chairperson shall be dismissed and a new Chairperson shall be elected from within the Committees ranks. Upon dismissal, the past Chairperson shall return be being an ordinary member of the Committee.

8.4 It shall be the duty of the Chairperson to ensure the orderly conduct of meetings and to ensure that all persons present and wishing to speak are given a reasonable opportunity to do so.

8.5 The Chairperson shall be unbiased in all the deliberations of the Committee.

8.6 The Chairperson shall be the spokesperson of the Committee.

8.7 The Chairperson shall have an executive function and shall be able to call emergency meetings outside of the regular Committee meetings as and when required.

8.8 The Chairperson will approve any formal communication to be distributed from the Committee as a group to a wider audience.

8.9 The Chairperson may resign at any time from the Committee by submitting his/ her resignation in writing to the Secretariat for tabling at the next Committee meeting. Once the resignation has been accepted, a new Chairperson shall be nominated from within the ranks of the Committee.

9. Environmental Control Officer

9.1 As per the provisions of Condition 3.2.13 of the RoD, a suitably qualified Environmental Control Officer (ECO) shall be appointed by Eskom for the construction phase. The ECO's appointment shall only terminate once the final rehabilitation measures are completed and the site has been handed over to Eskom by the Contractor.

9.2 The ECO shall act on behalf of the Committee, and shall report to and be accountable to the Committee.

9.3 The ECO shall audit compliance with the RoD, environmental legislation and the CEMP.

9.4 The ECO shall conduct regular site inspections and environment audits.

9.5 The ECO shall compile an environmental compliance report every two months and distribute this to the Committee. Once ratified by the Committee, this report shall be submitted to the DEAT Director of Environmental Impact Evaluation.

9.6 The ECO shall ensure that the compliance reports prepared by him/her are circulated at least 14 days before the date of the meeting at which they are to be considered.

10. Responsibilities of the Committee members

10.1 As the Project Proponent, Eskom shall:

10.1.1 Adhere to conditions in the RoD and implement the EMPs.
10.1.2 Provide sufficient resources for the effective functioning of the Committee. In this regard, in terms of the requirements of Condition 3.2.11.7 Eskom shall bear all costs associated with the Committee
10.1.3 Ensure that all reports and/or complaints directed at it by any person and the responses thereto are recorded in writing, which shall be made available at each meeting of the Committee. Any complaints directed to the various official departments shall be recorded and tabled for discussion.
10.1.4 Fulfil all roles as set out for members of the Committee.

10.2 The authorities represented on the Committee shall:

10.2.1 Oversee that all commitments in RoD, EMP, and any other authorizations issued for the proposed project, are met by being involved in the monitoring function of Committee.
10.2.2 Provide guidance on the functioning of the Committee.
10.2.3 Evaluate all reports and correspondence received from the Chairperson.
10.2.4 Fulfil all other roles as set out for members of the Committee.

10.3 The community organization represented on the Committee shall:

10.3.1 Provide insights based on local knowledge
10.3.2 Keep constituencies informed of progress with the implementation of the EMP and compliance with the RoD
10.3.3 Inform the Committee of any issues or concerns constituencies might have with regard to the environmental impact of the project.
10.3.4 Fulfil all roles as set out for members of the Committee.

10.4 The specialists represented on the Committee shall:

10.4.1 Provide such specialist inputs/ guidance as might be requested by the Committee

11. Accountability

11.1 Members of the Committee are accountable to their constituencies, and are responsible for keeping their members informed of the Committee's proceedings.
11.2 Participation by any member of the Committee shall not be interpreted as a waiver of such a person's right to challenge any issue outside the forum of the Committee.
11.3 The Committee shall report back to the DEAT on matters pertaining to the Project Bravo Power Station and associated infrastructure. The prior mechanisms for

reporting shall be the minutes of the Committee meetings and the ECO's environmental compliance reports.

11.4 The Proponent is responsible for the management of contractors on site in accordance with the CEMP; approved Method Statements and RoD conditions.

12. Administration

12.1 The ECO shall fulfil the function of Secretariat of the Committee and shall be responsible for convening meetings, taking minutes and the dissemination thereof to members. Specifically, as the Secretariat, the ECO's duties and responsibilities shall include:

- 12.1.1 Organisation of Committee meetings in consultation with the Chairperson.
- 12.1.2 Keeping all records of the Committee.
- 12.1.3 Taking minutes at all meetings of the Committee and ensuring accurate recordings of the proceedings off all meetings.
- 12.1.4 Attending to correspondence and keeping copies thereof.
- 12.1.5 Circulating notices to convene meetings.
- 12.1.6 Preparation of documents requested by the Committee.
- 12.1.7 Ensuring that minutes are forwarded to all members timeously.
- 12.1.8 Circulate documentation for the next meeting to all Committee members at least 14 days prior to the meeting.

12.2 Eskom will be responsible for the reimbursement of costs incurred by the ECO (both in terms of their monitoring and secretarial functions) and the specialists, as well as any costs incurred by the Chairperson, over and above what would normally be anticipated for Committee members.

12.3 The respective organisations represented on the Committee shall be responsible for funding attendance of their representatives (Community and Authorities).

13. Amendments

This ToR can only be amended with the necessary prior notification and in the presence of a full quorum. This document should be read together with the Environmental Monitoring Committee guidelines compiled by DEAT in terms of their Integrated Environmental Management, Information Series (*viz.* . DEAT [2005] *Environmental Monitoring Committees, Integrated Environmental Management, Information Series 21*, DEAT, Pretoria.)

14. Dispute resolution

Any disputes related to the roles and responsibilities of the Committee that cannot be resolved within the Committee, should be referred to DEAT for resolution.

Abbreviations

CBO:	Community Based Organisation
CEMP:	Construction Environmental Management Plan
NGO:	Non-governmental Organisation
DEAT:	Department of Environmental Affairs and Tourism (National)
DWAF:	Department of Water Affairs and Forestry
ECO:	Environmental Control Officer
EMC:	Environmental Monitoring Committee
EMP:	Environmental Management Plan
MDALA:	Mpumalanga Department of Agriculture and Land Affairs
RoD:	Record of Decision
ToR:	Terms of Reference

UNISA university of south africa

CAES RESEARCH ETHICS REVIEW COMMITTEE

Date: 10/11/2014

Ref #: **2014/CAES/141**
Name of applicant: **Ms ME Molepo**
Student #: **55744842**

Dear Ms Molepo,

Decision: Ethics Approval

Proposal: A review of the environmental authorisation process followed during the construction of Eskom's Kusile and Medupi power stations, South Africa

Supervisor: Ms GM Chadi

Qualification: Postgraduate degree

Thank you for the application for research ethics clearance by the CAES Research Ethics Review Committee for the above mentioned research. Final approval is granted for the duration of the project.

Please consider point 4 below for further action.

The application was reviewed in compliance with the Unisa Policy on Research Ethics by the CAES Research Ethics Review Committee on 06 November 2014.

The proposed research may now commence with the proviso that:

1) *The researcher/s will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.*
2) *Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study, as well as changes in the methodology, should be communicated in writing to the CAES Research Ethics Review Committee. An amended application could be requested if there are substantial changes from the existing proposal, especially if those changes affect any of the study-related risks for the research participants.*
3) *The researcher will ensure that the research project adheres to any applicable*

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150
www.unisa.ac.za

national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study.

4) *Eskom states in the permission letter that they reserve the right to withdraw approval for the publishing of the findings of the research. The researcher and supervisor should ensure that Eskom is aware that it cannot stop the student from submitting the dissertation to the examiners in order to obtain the qualification. They can, however, receive assurance that the information will be kept confidential. The researcher can also consider using pseudonyms instead of naming the particular power stations in the final dissertation.*

Note:
The reference number [top right corner of this communiqué] should be clearly indicated on all forms of communication [e.g. Webmail, E-mail messages, letters] with the intended research participants, as well as with the CAES RERC.

Kind regards,

Signature
CAES RERC Chair: Prof EL Kempen

Signature
CAES Executive Dean: Prof MJ Linington

PLEASE NOTE REQUIREMENTS

University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150
www.unisa.ac.za

Eskom

Prof Shadung Moja
Environmental Science Department
UNISA Science Campus
P.O Box X6
FLORIDA
1710

Date:
10 September 2014

Enquiries:
Tel +27 11 629 5585

Dear Prof. Moja

PERMISSION TO GRANT ACCESS TO ESKOM SITE AND DATA FOR ACADEMIC RESEARCH STUDY PURPOSE FOR MS EMMY MOLEPO, UNIVERSITY OF SOUTH AFRICA

This is to confirm that permission is granted for Ms Emmy Molepo, Unique no. 3932472 to conduct her academic research studies at Eskom' Medupi and Kusile Power Stations. As explained by Ms Molepo the research will only focus on environmental issues at the construction phases of these two stations.

The study is towards her Masters in Environmental Science registered with your university (University of South Africa) for 2014 and 2015 year of study. Access will be given to conduct site visits and relevant secondary data / information required.

Eskom would however like to sign off on Ms Molepo' final dissertation prior to release to the public. If in the process of reviewing the dissertation, Eskom believe the dissertation should not be released for public consumption Eskom will reserve permission to stipulate the dissertation and limit the release of the document by the University.

There must also be a disclaimer included in the final dissertation that is worded in such a way that it is clear the dissertation is Ms Molepo' work in pursuit of an academic qualification and not necessarily the view of Eskom on the subject.

We trust that you find the above in good order.

Should you have any further queries please do not hesitate to contact us.

Yours sincerely

Supported by: **Deidre Herbst**
Sustainability Division: Eskom Environmental Manager

Supported by: **Barry MacColl**
Sustainability Division: General Manager - Research, Testing and Development

Sustainability Division
Research, Testing and Development
Megawatt Park Maxwell Drive Sunninghill Sandton
PO Box 1091 Johannesburg SA 2000
Tel +27 11 800 3501 Fax +27 86 660 6092 www.eskom.co.za
Eskom Holdings SOC Limited Reg No 2002/015527/06

UNISA university of south africa

CONSENT FORM

TITLE OF RESEARCH PROJECT

A Review of the Environmental Authorization process followed during the construction of Eskom's Kusile and Medupi Power Stations, South Africa.

Dear Mr/Mrs/Miss/Ms _____ Date...../...../20...

NATURE AND PURPOSE OF THE STUDY

Environmental Authorisations are issued to project developments to ensure that environmental impacts as identified during the EIA process are avoided and/or minimized at both project construction and operational phases. The EA set out conditions which the development has to comply with to protect the environment for promoting sustainable development. The reason for this research is to determine the effectiveness of complying with the EA. If is just for the sake of complying with written conditions as per legislation or towards promoting sustainable development by minimizing the development impacts on the environment.

RESEARCH PROCESS

The study requires your participation in the following manner:

1. You will be required to complete a questionnaire.
2. The questionnaire may be discussed with you in an interview format for easy completion.
3. The questionnaire should be completed within 3 weeks.
4. There are no right or wrong answers and all opinions will be valued.
5. You do not need to prepare anything in advance to answer the questionnaire.
6. All participants will be given the opportunity to express an opinion, or agree or disagree with the opinion.

NOTIFICATION THAT PHOTOGRAPHIC MATERIAL, TAPE RECORDINGS, ETC WILL BE REQUIRED (Taking of photographs)

Your attention is drawn to the fact that the questionnaire interviews will be photographed to ensure that proof of those interviews are kept. You may request and/or scrutinise the photographs taken during interviews or site visits that you participated in.

CONFIDENTIALITY

The opinions of all the participants are viewed as strictly confidential, and only members of the research team will have access to the information. No data published in dissertations and journals will contain any information thorugh which participant members may be identified. Your anonymity is therefore ensured.

WITHDRAWAL CLAUSE

I understand that I may withdraw from the study participation at any time. I therefore participate voluntarily until such time as I request otherwise.

POTENTIAL BENEFITS OF THE STUDY

The study will determine whether the implementation of EA conditions is prioritised by projects/developments, complied with fully and ensure that sustainable development is at the forefront of developments that obtained EA's. The study will further illustrate the effectiveness or ineffectiveness of implementing the EA conditions for avoiding and/or minimizing further environmental damage as predicted or identified during the EIA phase of such projects.

INFORMATION

If I have any queries concerning the study, I may contact the supervisor, Prof Moja, at the Department of Environmental Sciences, Florida Campus, Unisa, Tel: 011 471 3878.

CONSENT

I, the undersigned, ... (full name) have read the above information relating to the project and have also heard the verbal version, and declare that I understand it. I have been afforded the opportunity to discuss relevant aspects of the project with the project leader, and hereby declare that I agree voluntarily to participate in the project.

I indemnify the university and any employee or student of the university against any liability that I may incur during the course of the project.

I further undertake to make no claim against the university in respect of damages to my person or reputation that may be incurred as a result of the project/trial or through the fault of other participants, unless resulting from negligence on the part of the university, its employees or students.

I have received a signed copy of this consent form.

Signature of participant: .....

Signed at ..... on .....

WITNESSES

1 .....

2 .....

Mpumalanga
TOURISM AND PARKS AGENCY

PERMIT

TO PICK AND CONVEY A PROTECTED PLANT

2813

(Issued in terms of the Provisions of the Nature Conservation Act 10 of 1998)

Name and residential address of holder of permit: M. Mudzielwana
Kusile Power station R545
Kendal/Balmoral Road
Haartebeespoort Farm

Mpumalanga Tourism ... HEADAGE STAMP:
2012 -07- 18
Private Bag X 11338 ... Nelspruit
District Service

DETAILS OF PERMIT

In terms of and subject to the provisions of the Nature Conservation Act, (Act 10 of 1998) and the regulations framed thereunder, the abovementioned person is hereby authorized, subject to the provisions and requirements appearing on this permit, to pick the number and species of protected plants referred to hereunder and to convey it to the address referred to above during the period of validity of this permit to the place referred to hereunder.

PLACE (Pick)

Name and Number	District	Name of Owner
Kusile Power Station	Nkangala	Eskom Holdings Limited Kusile Power station

Protected Plant(s):

BarPrint 201073 tel: (013) 712 2723

Number	Species	Number	Species
Open	Aloe marlothii	Open	Hypoxis spp.
Open	Eucomis autumnalis	Open	Protea welwitschii
Open	Boophane disticha		
Open	Watsonia spp.		
Open	Brunsvigia spp.		
Open	Gladiolus spp.		

Convey to: .....

Period of validity of permit: From the date of issue to: 31 December 20 12

Permit Fee: Received R 100.00 Receipt No. Electronical

For: CHIEF EXECUTIVE OFFICER

WILDLIFE PROTECTION SERVICES
Private Bag X11338 . Nelspruit 1200 . Tel. +27 (0) 13 759 5300/1 . Fax: +27 (0) 13 759 5490

SEE CONDITIONS & REQUIREMENTS ON REVERSE SIDE

SOUTH AFRICAN HERITAGE RESOURCES AGENCY
111 HARRINGTON STREET, CAPE TOWN, 8000
PO BOX 4637, CAPE TOWN, 8000
TEL: (021) 462 4502 FAX: (021) 462 4509

DATE: 22 August 2008
ENQUIRIES: Mrs Colette Scheermeyer
OUR REF: 9/2/248/0003

Mr Frank Teichert
National Cultural History Museum
149 Visagie Street
Sunnyside
Pretoria
0132

FAX: 012 328 5173

Dear Mr Teichert

PERMIT: No.80/08/07/005/51

I attach as requested a permit for the exhumation of graves older than 60 years to be affected by the development of a new power station by Eskom and the reinterment of the graves at Phola cemetery and Witbank cemetery, near Balmoral, Mpumalanag Province.

The SAHRA APM Unit wishes you success with the project.

Yours Sincerely

Mrs Mary Leslie
SAHRA: Manager of the Archaeology, Palaeontology and Meteorite Unit
For CHIEF EXECUTIVE OFFICER

SOUTH AFRICAN HERITAGE RESOURCES AGENCY

111 HARRINGTON STREET, CAPE TOWN, 8000
PO BOX 4637, CAPE TOWN, 8000
TEL: (021) 462 4502 FAX: (021) 462 4509

9/2/248/0003

PERMIT
No. 80/08/07/005/51

Issued under Section 36(3) of the National Heritage Resources Act, Act No. 25 of 1999. Permission is hereby given:

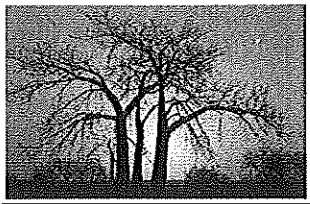
to: Mr FE Teichert (ID: 6912055200083),
of: the National Cultural History Museum, 149 Visagie Street, Sunnyside, Pretoria, 0132,
for: the exhumation of graves older than 60 years to be affected by the development of a new power station by Eskom and the reinterment of the graves at Phola cemetery and to the Witbank cemetery,
at: Hartebeesfontein 579JR and Klipfontein 566JR, at approximately 25 55 17.4E, 28 56 29.2S, near Balmoral,
in: the Witbank District, Mpumalanga Province.

The following conditions apply:

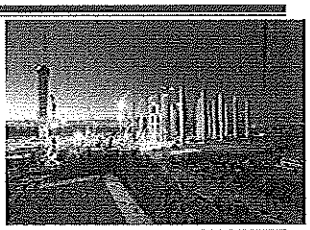
1. If the permit holder is not to be present on the site at all times then SAHRA must be provided with the names and qualifications of the authorised representatives.
2. Adequate recording methods as specified in the Regulations and Guidelines pertaining to the National Heritage Resources Act must be used. Note that the position of the grave must be marked on a plan of the site, and the site marked on a 1:50 000 map.
3. A standard site record form must be lodged with the National Cultural History Museum.
4. Human remains must at all times be handled with respect and graves should not be disturbed except where unavoidable. The consultation procedures as indicated in the gazetted regulations of the National Heritage Resources Act (Act No. 25 of 1999) must be observed as appropriate. The recommendations for removal of graves and exhumations and for re-burial made in SAHRA's Policy 'What to do when graves are uncovered', section 3, must be observed as far as possible.
5. Copies of field notes and records must be kept at the National Cultural History Museum.
6. A report on the excavation must be submitted to SAHRA on or before 1 September 2009.
7. Reprints of all published papers, or copies of theses or reports resulting from this work must be lodged with the relevant Provincial Heritage Resources Authority and SAHRA.
8. If a published report has not appeared within three years of the lapsing of this permit, the report required in terms of the permit will be made available to researchers on request.
9. It is the responsibility of the permit holder to obtain permission from the landowner for each visit, and conditions of access imposed by the landowner must be observed.
10. It is the responsibility of the permit holder to fill in excavations and protect sites during and after excavation to the satisfaction of the SAHRA and the landowner.
11. SAHRA shall not be liable for any losses, damages or injuries to persons or properties as a result of any activities in connection with this permit.
12. SAHRA reserves the right to cancel this permit by notice to the permit holder.
13. This permit is subject to a general appeal and may be suspended should an appeal against the decisions be received by SAHRA within 14 days from the date of the permit. SAHRA may not be held responsible for any costs or losses incurred in the event of the suspension or retraction of this permit.

This permit is valid until 1 September 2009.
for CHIEF EXECUTIVE OFFICER .....
Date: 22 August 2008

Place: Cape Town



Medupi Power Station Project
Environmental Monitoring Committee



MEDUPI ENVIRONMENTAL MONITORING COMMITTEE

TERMS OF REFERENCE

1. NAME AND ENABLING AUTHORITY

1.1 The Environmental Monitoring Committee (EMC) shall be known as the MEDUPI EMC.

1.2 The EMC is established in terms of Section 3.2.2 of the Medupi Power Station Record of Decision (RoD) (Ref: 12/12/20/695).

2. SCOPE

The scope of the EMC will include the following Environmental Authorisations (RoD's):

2.1 The Medupi Power Station RoD (Ref: 12/12/20/695) – Section 3.2.2

2.2 The Medupi Power Station RoD Amendment (Coal conveyor re-alignment)- Section 3.2.2

2.3 The Medupi Power Station Amendment (removal of the requirement for carbon monoxide monitoring) – Section 3.2.2

2.4 The Medupi Raw Water Reservoir and Associated Pipelines RoD (Ref: 12/12/20/1139) – Section 1.9

2.5 The Medupi Raw Water Reservoir and Associated Pipelines RoD Amendment (increase in storage capacity) – Section 1.9

2.6 The Medupi Power Station Ash storage, -treatment and-disposal licence (Ref:12/9/11/L50/6) – Section 11

2.7 The Telecommunications mast for Medupi RoD (Ref: 12/12/20/1228) – Section 1.11

2.8 The re-alignment of a Portion of the Afguns Road RoD (Ref: 12/12/20/1179) – Section 1.11

2.9 The Medupi Power Station Environmental Management Plan (EMP) (Ref:12/12/20/695) as amended

2.10 The Grootegeluk EMPR amended for the Coal silo, Coal conveyor and Associated infrastructure between the Grootegeluk Coal mine and Medupi Power Station (Ref: 5/3/2/50)

2.11 The Medupi Excess Coal Stockyard RoD (Ref: 14/12/16/3/3/1/531).

3. ROLES AND RESPONSIBILITIES

3.1 The role of the EMC is to facilitate communication and co-operation amongst the Local Constituencies that the EMC members represent, Local Authorities, provincial and national departments and Eskom. The public should not be dealing directly with construction staff.

3.2 The EMC will be responsible for monitoring and auditing project compliance to the condition of the RoD's, Environmental Legislation and specific mitigation requirements as stipulated in the EMP and Environmental Impact Report (EIR).

3.3 The Independent Environmental Control Officer (ECO) will be appointed by the developer as per condition 3.2.4 of the RoD in conjunction with the EMC.

3.4 The ECO's report on the implementation of the EMP will be monitored by the EMC. In the event of non-compliance, the EMC shall follow the non-conformance and escalation process outlined in item 9 below.

3.5 The EMC may make recommendations to Eskom in order to rectify and/or improve environmental management performance. In the event of any non-compliance not addressed, the EMC shall follow the non-conformance and escalation process outlined in item 9 below.

3.6 The EMC will be responsible for making recommendations to the Director-General (DG) of the Department of Environmental Affairs (DEA) on issues related to the monitoring and auditing of the project.

3.7 The EMC may provide feedback to the local community and other stakeholders.

3.8 Monitoring of the construction phase will be done by means of reviewing the reports produced by the ECO, as well as receiving project progress reports from Eskom. EMC members may conduct site inspections to monitor actual on-site environmental management performance and be provided with the necessary documentation such as method statements, procedures, non-conformance records and incident reports.

3.9 It is within the power of the EMC to instruct the attendance of contractors at meetings to report on matters pertaining to the Environment.

3.10 All records required by the EMC shall be made available on request.

3.11 All minutes of EMC Committee and EMC Public Meetings shall be made available on request and will be stored at a venue accessible to the public.

4. MEMBERSHIP

4.1 Membership must comprise the following individuals (See Table 1), who may delegate alternatives as necessary. The alternate nominations must be made known to the EMC prior to their appointment. Additional members may be nominated and voted in by a two thirds majority vote, should the need arise.

Category	Organisation
Chairperson	TOKISO
ECO	NCC Environmental Services
WMCO	NCC Environmental Services
Ecologist	Bathusi Environmental
Medupi Management Representative	Eskom
Medupi Environmental Representative	Eskom
Eskom Stakeholder Representative	Eskom
Air Quality Specialist	Eskom
I&AP	Community Representative - Marapong
I&AP	Community representative - Lephalale

4.2 The technical EMC members shall be appropriately qualified and experienced in order to execute their responsibilities in this committee. All members must familiarise themselves with the relevant Legislation, as well as the content of the RoD and EMP.

4.3 The EMC may nominate additional persons to the committee on an *ad hoc* basis by reason of their particular contribution and must be accepted by the Chairperson.

4.4 A person may not remain a member of the committee if he/she no longer has the mandate of the organisation he/she claims to represent, and may in such instance be removed and replaced by the EMC.

4.5 If an EMC member or their alternate does not attend two consecutive meetings without an acceptable reason, does not comply with the EMC Terms of Reference or does not

hold the spirit or intention of the EMC, the chair may request the organisation that the member represents to appoint a new member.

4.6 The EMC may establish working groups as they deem necessary to enhance the effectiveness of the EMC and to promote the objectives of the EMC. The working groups will operate under agreed terms of reference determined by the EMC, but will have no binding decision-making authority. They may make recommendations to the EMC. Membership of the working groups may include both members of the EMC as well as additional persons appointed in terms of section 4.3 above.

Table 1 – EMC Members

5. EMC MEETINGS

5.1 Meetings shall be conducted on a quarterly basis as stipulated in the letter from the DEA dated 25/06/2010 (Ref: 257-54054). This frequency may be revised and changes will be communicated to the DEA for approval.

5.2 The Committee meetings will be for attendance by committee members only, or by invitation by the Committee.

5.3 A minimum of six (6) members must be present to form a quorum at the committee meetings.

5.4 The agenda and supporting documentation will be distributed to EMC members three days in advance of a scheduled meeting.

5.5 The EMC meeting shall ratify changes to the Terms of Reference and EMP. Additionally, it shall consider recommendations from the Public meeting, make decisions and take actions in terms of these ToR, the project RoD and the EMP and monitor related actions taken by the Project to mitigate environmental impacts and ensure compliance to the RoD and EMP as well as Environmental Legislation.

5.6 Decisions and recommended actions shall be made at first instance by consensus, and if no agreement is reached, on majority vote. The minutes must reflect how a decision was taken and, where voting did occur, how the voting was cast.

5.7 Should there not be six (6) members attending (as stated in point 5.3), the meeting may continue and all decisions shall be carried over by the Chair. However, decisions and actions taken in such meetings will require acceptance or rejection by other EMC members of the quorum prior to the acceptance of the minutes. Therefore additional discussions will also form part of the accepted minutes.

5.8 The Chairperson may call an extraordinary EMC meeting should the need arise. A minimum of forty-eight (48) hours' notice must be given to members and the date of the meeting will be at the discretion of the Chairperson.

5.9 Meetings will be minuted and minutes will be distributed for comments within a week (inclusive of presentations and supporting documentation). If no comments are received within the agreed time period, the minutes will be deemed to have been approved. The approved minutes will be distributed to EMC members within two weeks thereafter.

6. PROCESS PROTOCOL FOR EMC MEETINGS

6.1 Members at meetings commit to arriving on time for each of the meetings, to commit their full attention to the process by switching off all computers, cellular phones and other electronic devices during the meetings, unless the device is used for purposes of the meeting.

6.2 Members appreciate that the Committee requires commitment of time, and will endeavour to make themselves available for the required time that is set aside for the EMC and Public meetings.

6.3 Documents that need to be exchanged between parties will be done so through the delegated administrator. Where possible, documents will be distributed before discussions.

6.4 Members agree that the role of the independent chair will be to manage the meetings. The independent Chair will have the authority to decide on all matters relating to process in these meetings.

6.5 A member at a meeting who wishes to speak should indicate and the chair will acknowledge the indication and afford that participant or member the opportunity to do so. All contributions in meetings will be made through the chair.

6.6 The members commit to communicating with each other in good faith at meetings.

6.7 To give practical effect to the concept of good faith discussions, members and participants to meetings will:

6.7.1 prepare well;

6.7.2 secure effective mandates from their constituencies;

6.7.3 act professionally towards each other;

6.7.4 treat each other with respect;

6.7.5 demonstrate consistency and reliability in their approach;

6.7.6 listen carefully to each other's submissions;

6.7.7 refrain from repeating points already made;

6.7.8 endeavour to understand, and in so far as they are able, provide for each other's interests;

6.7.9 avoid personality issues influencing discussions and behaviour, i.e. separate the person from the problem;

6.7.10 adapt a problem-solving, solution orientated approach to the issues;

6.7.11 identify priorities;

6.7.12 communicate honestly and accurately to principals/constituencies;

6.7.13 demonstrate leadership in dealing with principals/constituencies.

6.8 The independent chair will assist in problem solving and resolving deadlock on the EMC. However, where no agreement can be reached and there is deadlock, the EMC may call on an independent arbitrator to make an advisory arbitration award on a matter based on agreed terms of reference, and failing agreement, terms of reference approved by the chairperson. The EMC may also agree to other deadlock breaking mechanisms as it deems appropriate for the good governance of the EMC.

7. PUBLIC MEETINGS

7.1 The purpose of the Public Meeting is:

7.1.1 sharing information on the EMC and the activities of the EMC;

7.1.2 sharing information on the progress related to project environmental issues within the scope of the EMC;

7.1.3 offering a platform for the public to comment on issues within the scope of the EMC;

7.1.4 make recommendations to the EMC for consideration and to action any recommendation that is accepted by the EMC;

7.1.5 ensure that good communication between the EMC, role players, affected parties and interested parties is established and maintained.

7.2 The EMC will endeavour to hold these meetings on a quarterly basis. Meetings are anticipated to take place within the same week of the EMC meetings.

7.3 The Public meeting will be chaired by the EMC chairperson and EMC members will endeavour to attend these meetings.

7.4 The independent Chair will have the authority to decide on all matters relating to process.

7.5 Meetings will be minuted and minutes will be distributed for comments within a week to all attendees (inclusive of presentations and supporting documentation). If no comments are received within the five days of distribution thereof, the minutes will be deemed to have been approved. The approved minutes will be distributed prior to the next Public meeting.

7.6 Where a member of the public wishes to raise an issue but cannot attend the Public meeting, this may be submitted in writing to the Chairperson of the EMC for purposes of raising it at the Public meeting for discussion and comment.

7.7 A Logbook will be made available to the public at venues accessible to the public. This Logbook will enable Interested and Affected Parties to leave comments, complaints and make recommendations.

7.8 A participant who wishes to speak will indicate and the chair will acknowledge the indication and afford that participant the opportunity to do so. All contributions in meetings will be made through the chair.

7.9 Participants commit to communicating with each other in good faith. To give practical effect to the concept of good faith discussions, members and participants to meetings will:

7.9.1 prepare well;

7.9.2 secure effective mandates from their constituencies;

7.9.3 act professionally towards each other;

7.9.4 treat each other with respect;

7.9.5 demonstrate consistency and reliability in their approach;

7.9.6 listen carefully to each other's' submissions;

7.9.7 refrain from repeating points already made;

7.9.8 endeavour to understand, and in so far as they are able, provide for each other's' interests;

7.9.9 avoid personality issues influencing discussions and behaviour, i.e. separate the person from the problem;

7.9.10 communicate honestly and accurately to principals/constituencies on the outcome of Public meetings.

7.10 The Chairperson may call an extraordinary public meeting should the need arise. A minimum of ten (10) days' notice must be given to the public and interested and affected parties and the date of the meeting will be at the discretion of the Chairperson.

8. ACCOUNTABILITY, RESPONSIBILITY AND LIABILITY OF MEMBERS

8.1 EMC members are bound by these terms of reference.

8.2 EMC members must act in a responsible manner and are accountable to society at large.

8.3 EMC members are accountable to those constituencies that they represent and are responsible for keeping their constituencies informed of proceedings.

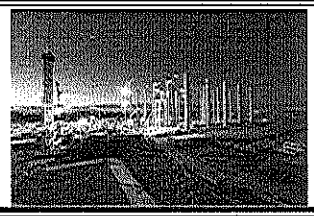
8.4 Nonetheless, National Government, Provincial Government, Local Authorities or committees appointed in terms of the conditions of the Medupi RoD (Section 3.3.17) or any other Public Authority or Authorisation shall not be held responsible for any damages or losses suffered by the applicant or his successor in title in any instance where

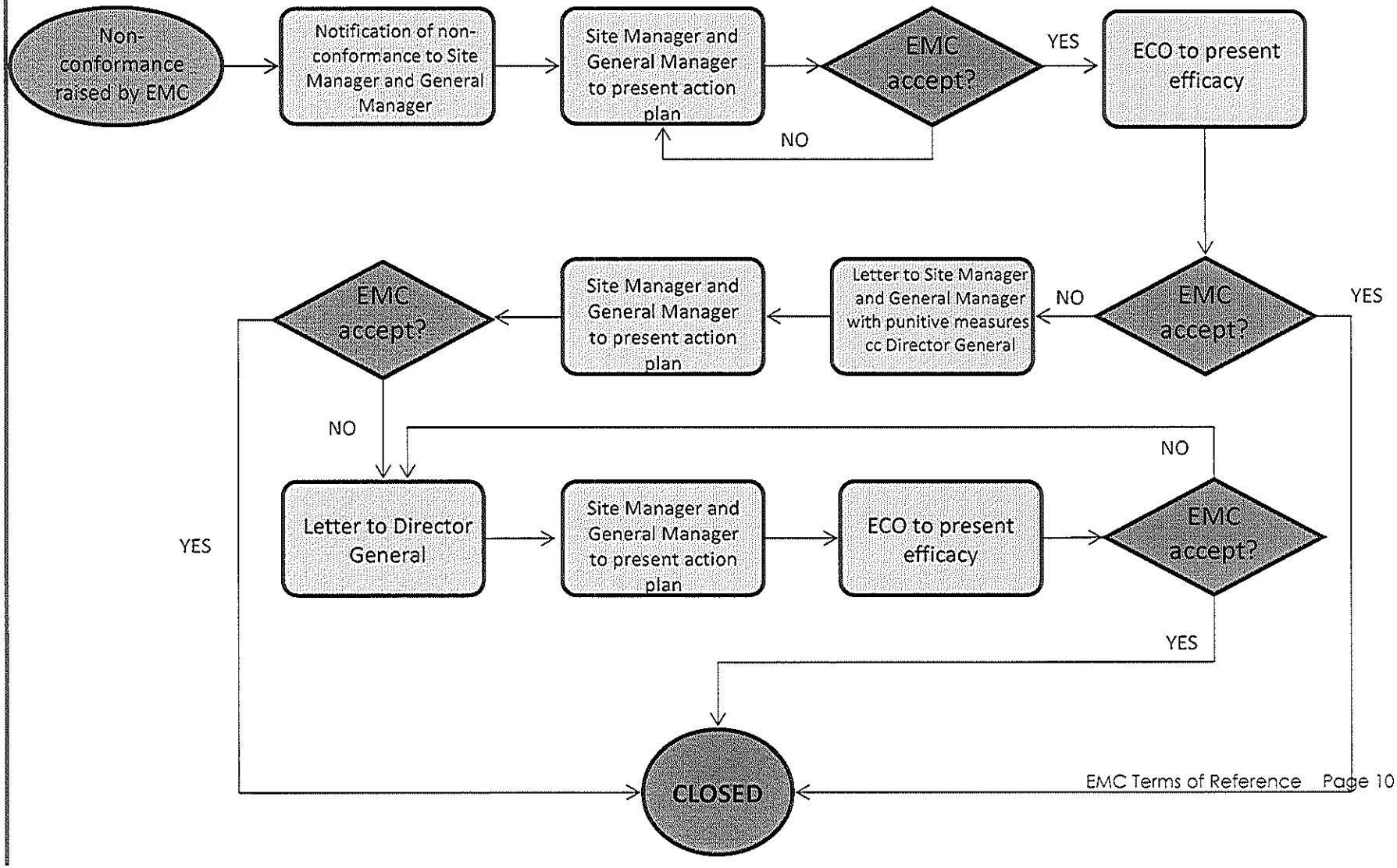
construction or operation subsequent to construction be temporarily or permanently stopped for reasons of non-compliance by the applicant with the conditions of approval as set out in the Medupi RoD or any other subsequent document emanating from RoD.

9. NON-CONFORMANCE AND ESCALATION PROCESS

9.1 Below is the Process Steps/Activity in the Medupi Non-conformance Process.

ID	Process Step/ Activity	Description
1.01	Notification of Non-conformance	Notification of Non-conformance is sent to Site Manager and General Manager.
1.02	Site Manager and General Manager to present action plan	Responsible party or Site Manager and General Manager to present action plan and implement if accepted by EMC.
1.03	ECO to present efficacy of actions	ECO to present efficacy of actions to EMC. EMC accepts = closed out EMC rejects = 1.04 initiated
1.04	Letter to Site Manager and General Manager	A letter detailing non-conformance is sent to Site Manager and General Manager by the EMC with punitive measures; cc Director General.
1.05	Site Manager and General Manager to present action plan	Site Manager and General Manager to present action plan and implement if accepted by EMC.
1.06	ECO to present efficacy actions	ECO to present efficacy to EMC. EMC accepts = closed out EMC rejects = 1.07 initiated
1.07	Letter to Director General	Letter is sent to Director General, copied to relevant authorities, stipulating punitive measures.
1.08	Site Manager and General Manager to present action plan	Site Manager and General Manager to present action plan and implement if accepted by EMC.
1.09	ECO to present efficacy of actions	ECO to present efficacy to EMC. EMC accepts = closed out EMC rejects = 1.07 initiated




Non-conformance raised by EMC
Notification of non-conformance to Site Manager and General Manager
Site Manager and General Manager to present action plan
EMC accept?
YES
NO
ECO to present efficacy
EMC accept?
NO
YES
Letter to Site Manager and General Manager with punitive measures cc Director General
Site Manager and General Manager to present action plan
EMC accept?
NO
YES
Letter to Director General
Site Manager and General Manager to present action plan
ECO to present efficacy
EMC accept?
NO
YES
CLOSED

10. COSTS

10.1 All costs incurred for the effective functioning of the EMC will be met by Eskom. These may comprise the hiring of the meeting venue, travel, accommodation and disbursement costs, administrative costs and training of committee members.

11. COMPLETION OF CONSTRUCTION

11.1 Upon completion of construction, the role, responsibilities and constitution of the EMC shall be re-considered and re-established with new terms of reference for the operation phase of the development.

Signed:

General Manager: Medupi
2013-3-7

EMC Chairperson
5|03|2013

agriculture,
forestry & fisheries

Department:
Agriculture, Forestry and Fisheries
REPUBLIC OF SOUTH AFRICA

200-163627

Enquiry: Mrs. NA Mudau, Tel: 015 290 1354, Email: MudauN3@dwa.gov.za

LICENCE

TO AUTHORISE ACTIONS AND ACTIVITIES AFFECTING PROTECTED TREES

MEDUPI POWER STATION 2nd Renewal

CUT PROTECTED TREES IN TERMS OF [SECTIONS 15(1) OF THE NATIONAL FORESTS ACT, 1998, AS AMENDED]

This licence –

Grants authority under the National Forests Act, 1998 (Act No. 84 of 1998), as amended, to carry on one or more of the activities, upon such conditions, and for such a period, as specified in more detail below;

Does not exempt the licensee from adhering to the provisions of any other law; is valid for the period:

09 APRIL 2015 TO 09 APRIL 2016

Must be renewed at the nearest Forestry office before expiry of the specified period if still required.

A PARTICULARS OF LICENCE AND GENERAL INFORMATION

Name	ESKOM MEDUPI POWER STATION					
Representative	EMILE MARELL					
ID Number	790709 5075 080					
Postal address	PRIVATE BAG X7502					
	LEPHALALE					
	0557					
Physical address	1 ENGLIN ROAD, BUILDING 2					
	GROUND FLOOR, SANHILL PARK					
	2017					
Tel. / Cell. / Fax numbers	Tel.		Cell.	082 560 4618	Fax	086 539 9739
Email						
Name and number of property	TURVLAKTE 463 LQ, NAAUWONTKOMEN 509 LQ,HANGLIP 503 LQ, KOOMDRAAI 690 LQ, KUIPERBUILT 511 LQ AND GROOTVALLEI 515 LQ					
Location of property	TURVLAKTE 463 LQ, LEPHALALE LM, WATERBERG DM, LIMPOPO PROVINCE					
Name of forest	N/A					

B LICENSED ACTIVITIES

1. In respect of protected trees:
   CUT/DESTROY: (250) *Acacia erioloba*, (200) *Boscia albitrunca, (150) Combretum imberbe,* (280) trees of *Sclerocarya.*
   TRANSPLANT: (50) *Acacia erioloba,(50) Boscia albitrunca, (30) Combretum imberbe* and (40) trees of *Sclerocarya birrea.*
   TRANSPLANT: (50) *Acacia erioloba,(60) Boscia albitrunca, (20) Combretum imberbe,* (80) *Sclerocarya birrea* and *(05)* trees of *Adansonia digitata* for the construction of the Medupi Power Station, the association infrastructure as well as the construction of the conveyor belt, silo and the approach ramps to the mine bridge at the farm Turkvlakte 463 LQ.
   .

2. Cutting of live trees:
   According to sustainable management plan? N/A

3. Number and size of trees per species:
   (a) Number: (350) *Acacia erioloba* (310) *Boscia albitrunca*, (200) *Combretum imberbe,* (400) *Sclerocarya birrea* and *(05) trees* of *Adansonia digitata.*
   (b) Size: Vary in height
4. Estimated quantity / volume of product per specie: 1265 trees in total
5. Origin: South Africa, Limpopo Province
6. Destination: Lephalale LM, Waterberg DM, Limpopo Province
7. Specifications: this permit is only for trees affected by the above activity.

C LICENCE CONDITIONS

1. **General licence rules:**

   This licence is –
   (a) Not transferable (you cannot pass, or cede it to another person), and
   (b) Only valid for the period it was issued for.
   (c) Only tree/trees stated in the permit should be removed

2. **Showing this licence:**

   (a) You must produce this license together with your valid identity document on demand to any forest officer or police officer.
   (b) The person(s) moving or transporting these trees or their related products on your behalf must at all times be in possession of a certified/ stamped copy of this license.

3. **Specific conditions:**

   (a) No part of the trees may be transported without any form of permit/license.
   (b) The license will only apply to the removal of the following specified protected tree species: *Acacia erioloba, Boscia albitrunca*, *Combretum imberbe, Sclerocarya birrea* and *Adansonia digitata,* within the specified area.

Failure to comply with the stipulated conditions will have legal consequences or cancellation of the license.

DEPARTMENT OF AGRICULTURE FORESTRY AND FISHERIES
2015 -04- 13

DIRECTOR-GENERAL

DATE STAMP

environment & tourism
Department:
Environmental Affairs and Tourism
REPUBLIC OF SOUTH AFRICA

Private Bag X447, Pretoria, 0001 • Fedsure Building, 315 Pretorius Street, Pretoria, 0002. Tel: (+27 12) 310 3911 Fax: (+27 12) 322 2682

Ref: 12/12/20/807
Enquiries: L.Grobbelaar
Tel: (012) 310-3087 **Fax:** (012) 320-7539 **e-mail:** LGrobbelaar@deat.gov.za

Attention: **Ms Deirdre Herbst**
Eskom Holdings Limited: Generation Division
PO Box 1091
Johannesburg
2000

Tel: 011 800-3501
Fax: 011 800-5140

Dear Ms Herbst

RECORD OF DECISION FOR THE CONSTRUCTION OF THE ESKOM GENERATIOIN PROPOPSED 5400MW COAL-FIRED POWER STATION, WITBANK

Your application for authorization, in terms of section 22 of the Environment Conservation Act, 1989 (Act No. 73 of 1989) in respect of an activity identified in terms of section 21 of the said Act, regarding the above matter refers.

By virtue of the power delegated to me in terms of section 33(1) of the Environment Conservation Act, 1989 (Act No. 73 of 1989) I hereby, in terms of section 22(3) of the Act, authorize:

The construction of a 5400MW coal-fired power station with ancillary uses on the Farm Hartbeesfontein 537 JR and the Farm Klipfontein 566 JR.

Enclosed please find the record of decision and the conditions under which your application is authorized.

In terms of Section 35 of the Environment Conservation Act, 1989 (Act No. 73 of 1989) and regulation 11 of Government Notice No. R.1183 of 5 September 1997, appeals on the record of decision can be lodged with:

The Minister of Environmental Affairs and Tourism
Private Bag X447
Pretoria
0001

Fax: (012) 322 0082

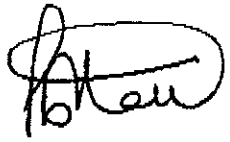
Appeals must comply with the provisions of regulation 11 of the Environmental Impact Assessment regulations, (Government Notice No. R. 1183 of 5 September 1997), which reads as follows:

(1) An appeal to the Minister or the provincial authority under section 35(3) of the act must be done in writing within 30 days from the date on which the record of decision was issued to the applicant in terms of regulation 10(1);

(2) An appeal must set out all the facts as well as the grounds of appeal, and must be accompanied by all relevant documents or copies of them, which are certified as true by a commissioner of oaths.

(3) An appeal questionnaire may be used in the lodging of an appeal. It is obtainable from the department's offices at tel. (012) 310 3590 or e-mail: cveeden@deat.gov.za.

Yours sincerely



Ms Pam Yako
Director – General
Department of Environmental Affairs and Tourism
Date: 05/06/07

cc: **Brett Lawson**
Ninham Shand Consulting Services 044 874-2165

RECORD OF DECISION FOR PROJECT REFERENCE 12/12/20/807: CONSTRUCTION OF THE ESKOM GENERATION PROPOSED 5400MW COAL-FIRED POWER STATION, WITBANK

By virtue of the power delegated by the Minister in terms of section 33(1) Environment Conservation Act, (Act 73 of 1989) ("the Act"), I hereby, in terms of section 22(3) of the Act, authorise Eskom Holdings Limited to undertake the activities specified/ detailed below subject to the indicated conditions.

1. DESCRIPTION, EXTENT AND LOCATION OF THE ACTIVITY:

The proposed development will include the construction of a 5400MW coal-fired power station and ancillary uses near Witbank, on approximately 2500ha of the Farm Hartbeestfontein 537 JR and the Farm Klipfontein 568 JR. Site X was identified as the preferred site for the proposed coal-fired power station.

The proposed project will consist of the establishment of the following components:

- Power station precinct:
  - Power station buildings;
  - Administrative buildings (control buildings, medical, security etc); and
  - High voltage yard.
- Associated infrastructure:
  - Coal stock yard;
  - Coal and ash conveyors;
  - Water supply pipelines (temporary and permanent);
  - Water and wastewater treatment facilities;
  - Ash disposal systems;
  - Access roads (including haul roads);
  - Dams for water storage; and
  - Railway siding and / or line for sorbent supply.

The proposed site falls within the jurisdiction of Delmas Local Municipality within the Mpumalanga Province.

2. KEY FACTORS INFORMING THE DECISION:

2.1 In reaching its decision in respect of the application, the Department of Environmental Affairs and Tourism ("the Department") has taken, *inter alia*, the following into consideration:

a) The information contained in the:
   - Plan of Study for Scoping dated April 2006.
   - Final Scoping Report (FSR) dated October 2006.
   - Final Environmental Impact Report (FEIR) dated February 2007.
   - Specialist Reports contained in Volumes 2, 3 and 4 of the FEIR dated November 2006 and February 2007.

b) Compliance with applicable international and national legislation and Departmental policies:
    - The Act
    - The principles set out in Section 2 of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA).
    - Process 29 set out in the Scheduled processes under the Second Schedule to the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965).
    - The principles of sound management of toxic chemical set out in Chapter 19 of Agenda 21.
    - Minimum requirements for landfills by the Department of Water Affairs and Forestry (second edition, 1998).
    - Stockholm Convention.

2.2 In reviewing this information, the Department made the following findings:

- The proposed development is part of Eskom's new capacity installation programme and is intended to meet the future base load electricity demands of South Africa, which is under severe pressure.
- The purpose of the proposed power station is to increase the Eskom Generation base load capacity to facilitate the forecast increase in demand by 2010 and to further supply this additional capacity in such a way that it improves security of supply to the national grid system and South Africa in its entirety.
- The proposed coal-fired power station will be a direct dry cooled, coal-fired pulverised fuel power station and will have a generation capacity of 5400 MW.
- Existing sources of atmospheric emission which occur in the vicinity of the proposed development sites include:
    - Emissions from various Eskom power stations;
    - Stack, vent and fugitive emissions from industrial operations;
    - Fugitive emissions from mining operations, including mechanically generated dust emissions and gaseous emissions from blasting and spontaneous combustion of discard coal dumps;
    - Vehicle entrainment of dust from paved and unpaved roads;
    - Vehicle tailpipe emissions;
    - Household fuel combustion (particularly use of coal);
    - Biomass burining (veld fires); and
    - Various other fugitive dust sources, e.g. agricultural activities and wind erosion of open areas.
- The proposed power station is in close proximity to the existing Kendal Power Station.
- The burning of coal in the proposed power station will potentially release significant amounts of air pollutants such as Sulphur Dioxide (SO_2), Nitrogen oxides (NO_x), Carbon Monoxide (CO), and trace emissions of various heavy metals.
- Considerable potential exists for cumulative concentrations and increases in the magnitude and frequency of SO_2 limit exceedances and hence the spatial extent of non-compliance.
- Ambient SO_2 standards are already being exceeded in the area where the new power station is proposed.
- Wet Flue Gas Desulphurisation (FGD) with at least 90% removal efficiency will be implemented.
- Compliance with ambient SO_2 limits cannot be achieved through the implementation of SO_2 abatement technologies for the proposed power station, given that the current non-compliance is due to existing sources. The implementation of SO_2 abatement technologies can however avoid any significant increases in non-compliance from the current situation.
- The proposed power station will potentially release significant amounts of greenhouse gases, namely, Carbon Dioxide (CO_2) and Nitrous Oxide (N_2O).

- The proposed power station would increase the South African energy sector's CO_2 equivalent emissions by some 12,8% and would increase the country's contributions towards the emission of greenhouse gasses by some 9,7%.
- The proposed power station would operate under Eskom's Zero Liquid Effluent Discharge policy and accordingly no water or effluent would be discharged into local river systems.
- Above-ground ash dumping will be employed as the preferred ash disposal method. The impacts of this method are manageable and are therefore an acceptable means of ash disposal.
- The establishment of a power station on the proposed site will result in the loss of approximately 2500ha of agricultural land.

Based on the information considered, the Department's conclusions are that:

a) the proposed activities may lead to substantial detrimental impact on the environment;
b) the need for the project have been adequately demonstrated;
c) the activities will result in socio-economic benefits, not only to the Witbank area, but to the country as a whole;
d) the implementation of the mitigation measures and conditions set out in this Record of Decision, are considered adequate to minimise detrimental impacts to acceptable levels;
e) subject to successful implementation of conditions and mitigation measures, the proposed development is likely to be acceptable; and
f) the principles of section 2 of NEMA can largely be upheld.

The Department has accordingly decided to grant Eskom Holdings Limited authorisation in terms of Regulations R 1182 and R 1183 (as amended), promulgated under section 21, 22 and 26 of the Environment Conservation Act (Act 73 of 1989) for the activities specified below, subject to the conditions and provisions listed below.

3. CONDITIONS

3.1 Description of the activity

The authorisation applies in respect of the following activities as listed in Schedule 1, regulation R. 1182 and described in Plan of Study for Scoping dated April 2006:

- Item 1: The construction, erection or upgrading of-
  - (a) facilities for commercial electricity generation with an output of at least 10 megawatts and infrastructure for bulk supply;
  - (c) with regard to any substance which is dangerous or hazardous and is controlled by national legislation-
    - infrastructure, excluding road and rails, for the transportation of any such substance; and
    - manufacturing, storage, handling, treatment or processing facilities for any such substance;
  - (d) roads, railways, airfields and associated structures;
  - (g) structures associated with communication networks, including masts, towers and reflector dishes'
  - (l) schemes for the abstraction or utilisation of ground or surface water for bulk supply purposes;
  - (n) sewerage treatment plants and associated infrastructure;
- Item 2: The change of land use from-
  - (c) agricultural or zoned undetermined use or an equivalent zoning to any other land use.

- Item 8: The disposal of waste as defined in section 20 of the Act, excluding domestic waste, but including the establishment, expansion, upgrading or closure of facilities for all waste, ashes and building rubble.

3.2 SPECIFIC CONDITIONS

3.2.1 Water quality management

3.2.1.1 All risk reduction recommendations made in the Hydrogeological Assessment, GCS (Pty) Ltd dated 14 November 2007 must be considered during the planning of the new power station.

3.2.1.2 All polluted water must be recycled until all pollutants are captured as waste for disposal with the ash deposition.

3.2.1.3 Eskom must ensure that the metering procedure of water supplied to the proposed power station must measure to a level of accuracy of 0,5%. Water and salt balances must be carried out once a month to verify performance and identify potential problems.

3.2.1.4 Leak detections and inspections, on site and along pipelines must be implemented.

3.2.1.5 The cooling water sludge from the cold lime softening process be co-disposed with the ash.

3.2.1.6 The sludge removed from raw water storage dams and reservoirs must be used in borrow pits or cover for waste sites.

3.2.1.7 The "dirty" water generated on site and considered for irrigation must be tested to determine its suitability in terms of salinity and Sodium Absorption Ratio (SAR).

3.2.1.8 Eskom must continuously monitor the ground water quality and implement measures to ensure that pollution of the resource does not occur. The monitoring programme for water quality and measures to control and prevent pollution of the resource shall be included in the operational EMP.

3.2.2 Faunal and floral management

3.2.2.1 A site specific wetland assessment and a rare and endangered species survey must be undertaken during the appropriate season. This must inform the identification of less sensitive areas, for the positioning of corridors for pipelines, roads, railways and coal conveyors. These corridors should be planned in a way that avoids or minimises the impacts on wetlands.

3.2.2.2 All unavoidable construction within wetland areas must be done so as to minimise disturbance of the pedology which would directly affect subterranean hydrology in wetlands systems.

3.2.2.3 A revised layout must be submitted indicating how the proposed corridors for the pipelines, roads, railways and coal conveyors have taken the wetlands into consideration during the planning stage of the proposed alignment of these routes. This revised layout must also indicate where the proposed dams for water storage will be constructed.

3.2.3 Visual impact management

3.2.3.1 The following design measures must be implemented at the proposed power station to ensure that visual intrusion is kept to the minimum:

- Treat building facades and roofs with a muted, mat paint that is similar to the prevailing colour of the landscape.
- Avoid very light or dark finishings that will increase colour contrast with the foreground and background.
- Reduce the use of reflective building materials such as glass to avoid glare and visual discomfort to viewers.
- Screen planting should be introduced along perimeter roads passing the site, around the coal stockyard and the ash dump to screen views of the proposed project components.
- Avoid over-illumination of outdoor spaces. Low pressure sodium lights are regarded as highly energy efficient and suitable for security lighting.

3.2.3.2 Retain the existing vegetation cover of the site through selective clearing. This will ensure that screening takes place during the construction and operational phases of the development.

3.2.3.3 The ash dump's final slope configuration should avoid sharp angles and straight lines. The slope typically consists of benches and rises. The edges that will be created as a result of these changes in slope should be rounded to create an even light distribution over the edge and avoid distinct, straight shadow lines.

3.2.4 Noise impact management

3.2.4.1 The Gauteng and the National Noise Control Regulations as well as SANS 10103:2004 must be used as the main guidelines for addressing the potential noise impact on this project.

3.2.4.2 Buildings housing noisy machinery must be insulated in order to minimise the transmission of noise through the walls and roof.

4.2.4.3 Noise mitigation measures must be investigated by an acoustical engineer. More information with regards to the cooling fan shielding needs to be provided to this Department.

3.2.5 Social risk management

3.2.5.1 A Quantitative Risk Assessment must be undertaken in terms of the Major Hazardous Installation (MHI) Regulations (July 2001) prior to construction. This MHI must be undertaken once the detailed engineering designs and layouts have been developed. The findings of this assessment must be incorporated into the construction Environmental Management Plan (EMP).

3.2.6 Heritage impact management

3.2.6.1 All recommendations made and mitigation measures proposed in the Heritage Impact Assessment, National Cultural History Museum dated October 2006 must be implemented for the 9 culturally important identified sites on the proposed property.

3.2.6.2 The South African Heritage Resource Agency (SAHRA) must be informed if any of the 9 culturally important identified sites are going to be impacted upon by the proposed development.

3.2.7 Air quality management

3.2.7.1 Eskom must install, commission and operate any required SO_2 abatement measures that may be necessary to ensure compliance with any applicable emission or ambient air quality standards published in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004).

3.2.7.2 Particulate abatement measures such as bag filters or electrostatic precipitators must be implemented at the proposed power station to reduce PM_{10} emissions.

3.2.7.3 Eskom must initiate a programme of support for initiatives aimed at improving air quality in the Witbank residential area. This programme must be included in the operational EMP.

3.2.7.4 The power station must be operated in compliance with any related Registration Certificate issued in terms of the Atmospheric Pollution Prevention Act, Act 45 of 1965, or any related Atmospheric Emission License issued in terms of the National Environment Management: Air Quality Act, Act 39 of 2004.

3.2.7.5 Low NOx burners must be included in the design of the boilers to reduce the NOx levels.

3.2.7.6 Eskom must indicate which technology will be installed to reduce the emission of mercury to the atmosphere. The percentage and minimum of by how much this reduction will take place must be provided in the construction EMP.

3.2.8 Traffic impact management

3.2.8.1 The future proposed alignment of the K29/1 intersects the proposed site. The road alignment must be verified with the Mpumalanga Roads Department before the commencement of the design of access roads to the site.

3.2.8.2 The internal road network utilized for access to the site must be resurfaced, upgraded or reconstructed as required. Special attention must be given to providing adequate drainage and subsurface drainage systems on all roads.

3.2.9 Socio-economic impact management

3.2.9.1 Community forums and communication channels between the local communities, construction companies / contractors and Eskom must be established and maintained.

3.2.9.2 Assistance must be provided to the inhabitants on site through skills development and job opportunities. Information with regards to this must be included in the environmental compliance report to be undertaken by the Environmental Control Officer (ECO)(refer to 3.2.13.4 below).

3.2.10 Agricultural impact management

3.2.10.1 Eskom must provide the Department with an action plan related to the surplus land, not occupied by infrastructure related to the power station which could be leased to farmers for the utilization of agricultural production. This action plan must be included in the operational EMP.

3.2.11 Environmental Monitoring Committee (EMC)

3.2.11.1 This development is authorised on condition that the developer establishes an EMC with clear terms of reference as described in 3.2.11.6.

3.2.11.2 Amongst others the EMC shall consist of the following members:

(a) A chairperson as described in 3.2.11.3,
(b) The ecologist that participated in the EIA process, or any other suitably qualified and experienced ecologist approved for this purpose by the Department,
(c) Representatives from the public (at least two people),
(d) Environmental Control Officer (ECO) (once appointed in terms of 3.2.13 below),
(e) A senior site manager from the main contractor, and
(f) An air quality specialist.

3.2.11.3 The EMC must appoint an independent chairperson who has appropriate people and project management skills.

3.2.11.4 The EMC must meet on a bi-monthly basis from the inception of the project.

3.2.11.5 The EMC must report to the Director of Environmental Impact Evaluation of the Department of Environmental Affairs and Tourism on a bi-monthly basis and the report must include matters as described in 3.2.11.6 below.

3.2.11.6 The purpose of the EMC is to execute the following:

(a) To monitor and audit project compliance to the conditions of this record of decision, environmental legislation and specific mitigation requirements as stipulated in the environmental impact report and the Environmental Management Plans.
(b) To make recommendations to the Director of Environmental Impact Evaluation on issues related to the monitoring and auditing of the project.
(c) The EMC shall decide on the frequency of meetings should a need arise to review the prescribed frequency. This change should be communicated to the Department for acceptance.

3.2.11.7 All costs associated with the EMC shall be borne by the applicant. The terms of reference for the EMC must, in addition to the scope of work as detailed in 3.2.11.6, clearly set out roles and responsibilities related to logistical arrangements, administration and financial arrangements associated with the EMC.

3.2.11.8 Upon completion of construction, the role, responsibilities and constitution of the EMC shall be re-considered and re-established with new terms of reference for the operational phase of the development.

3.2.12 Environmental Management Plan (EMP)

3.2.12.1 Eskom must submit a site specific construction EMP to the relevant authorities for acceptance before commencement of any of the activities related to this authorisation. The EMP must include but not be limited to the following aspects:

- Rehabilitation of all areas disturbed during the construction phase of the project excluding those areas where permanent structures are erected.
- Siting and management of construction camps, sanitation, ablution and housing facilities as well as material storage areas used by the contractor. All work areas must be supplied with proper sanitation facilities.
- Management and rehabilitation of access roads to individual construction areas that will not become permanent roads upon completion of construction. Any new road constructed for any purpose not authorised as part of this authorisation, must comply with the relevant SANS codes and permission for construction must be obtained from DEAT as required by Schedule 1, item 1 (d) of R. 1182.
- Waste avoidance, minimisation and disposal of waste at an appropriate facility.
- Protection of any heritage sites likely to be impacted by the development should such sites be found during any phase of the project to follow.
- Provisions for harvesting of any medicinal plants that may occur on site prior to site clearance.
- Protection of indigenous vegetation where such is not affected by the physical footprint of the power station plant or ancillary infrastructure and associated construction works.
- Provision for plant search and rescue of protected and endangered species which should be done before commencement of any construction related activity.
- Management of traffic during the construction phase of the development where the site access roads and other transportation networks intersect.
- Measurement, monitoring and management of noise and dust pollution levels during the construction phase.
- A fire control management plan for implementation on site.
- Implementation of site specific erosion and sediment and dust control measures during the construction phase of the project.
- Insofar as it relates to the activities hereby approved, all recommendations and mitigation measures as proposed in the final environmental impact report dated February 2007 forms part of this record of decision and must be implemented as part of the EMP.

3.2.12.2 Once accepted by DEAT, the revised construction EMP will be seen as a dynamic document. However, any changes to the EMP, must be submitted to DEAT for acceptance before such changes could be effected. Such a submission for consideration by DEAT must be accompanied by recommendations of the EMC.

3.2.12.3 Compliance with the accepted construction EMP must form part of all tender documentation for all contractors working on the project and must be endorsed contractually.

3.2.12.4 Eskom must submit an EMP for the operational phase of the development to DEAT and other relevant provincial and local authorities for acceptance prior to the completion of construction phase and the inception of the operational phase of the development. The revised operational EMP will be seen as a dynamic document. However, any substantial changes to the operational EMP, which is environmentally defendable, must be submitted to DEAT for acceptance before such changes could be effected.

3.2.13 Environmental Control Officer (ECO)

3.2.13.1 The developer must appoint a suitably qualified Environmental Control Officer (ECO) who would on behalf of the EMC, on a daily basis monitor the project compliance with conditions of the record of decision, environmental legislation and recommendations of the EMP. The cost of the ECO shall be borne by the applicant.

3.2.13.2 The ECO must be appointed one month before the start of construction and the authorities must be notified of such an appointment for communication purposes.

3.2.13.3 The ECO shall ensure that periodic environmental performance audits are undertaken on the project implementation.

3.2.13.4 The ECO shall submit an environmental compliance report on a two-monthly basis, in writing, to the Director of Environmental Impact Evaluation of the Department of Environmental Affairs and Tourism (DEAT), copied to the Mpumalanga Department of Agriculture and Land Administration.

3.2.13.5 The ECO shall maintain the following on site:

- A daily site diary
- A non-conformance register
- A public complaint register
- A register of audits

3.2.13.6 The ECO shall remain employed until all rehabilitation measures, as required for implementation due to construction damage, are completed and the site is handed over to Eskom by the contractor for operation.

3.2.13.7 The ECO shall report to and be accountable to the EMC.

3.2.14 Monitoring and auditing

3.2.14.1 Records relating to monitoring and auditing must be made available for inspection to any relevant authority in respect of this development.

3.2.14.2 This Department reserves the right to monitor and audit the development throughout its full life cycle to ensure that it complies with the conditions stipulated in the record of decision as well as mitigation measures in the final environmental impact report dated February 2007, construction and operational EMPs.

3.2.15 Transportation and handling of hazardous materials.

3.2.15.1 During the construction of the power station, an effective monitoring system must be put in place to ensure safety and to detect any leakage or spillage of coolants from all oil containing equipment during transportation, their handling and installation.

3.2.15.2 The transportation and handling of hazardous substances must comply with all the provisions of the Hazardous Substances Act, (Act No.15 of 1973), associated regulations as well as SABS 0228 and SABS 0229 codes.

3.2.16 Rehabilitation after construction

3.2.16.1 No exotic plant species may be used for rehabilitation purposes. Only indigenous plants may be utilised.

3.2.16.2 Measures aimed at controlling invasive plant species and weeds must be implemented and must form part of the relevant EMP.

3.2.16.3 No disturbance of the land at any stream, rivers edge or wetland is allowed unless such disturbance complies with legislation and conforms to strict design parameters.

3.2.17 Compliance with other legislation

3.2.17.1 Archaeological remains, artificial features and structures older than 60 years are protected by the National Heritage Resources Act, 1999 (Act No. 25 of 1999). Should any archaeological artefacts be exposed during excavation for the purpose of laying foundations, construction in the vicinity of the finding must be stopped. An archaeologist must be called to the site for inspection. Under no circumstances shall any artefacts be destroyed or removed from the site. SAHRA must be contacted to this effect. Their recommendations should be included in the construction EMP and be adhered to.

3.2.17.2 All provisions of the Occupational Health and Safety Act, 85 of 1993, and any other applicable legislation must be adhered to by the holder of this authorisation.

3.2.17.3 All provisions of the National Water Act, Act 36 of 1998, must be adhered to by the holder of this authorisation.

3.2.17.4 All provisions of the National Environment Management: Air Quality Act, Act 39 of 2004, must be adhered to by the holder of this authorisation.

3.2.17.5 All provisions of the Atmospheric Pollution Prevention Act, Act 45 of 1965, must be adhered to by the holder of this authorisation.

3.2.17.6 All provisions of the National Environment Management Biodiversity Act, Act 10 of 2004, must be adhered to by the holder of this authorisation.

3.2.17.7 Should fill material be required for any purpose, the use of borrow pits must comply with the provisions of the Minerals and Petroleum Resources Development Act, 28 of 2002 administered by the Department of Minerals and Energy.

3.2.17.8 A permit shall be obtained from the provincial department of nature conservation for the removal of indigenous protected and endangered plant and animal species.

3.3 GENERAL CONDITIONS

3.3.1 This authorisation is granted only in terms of section 22 of the Environment Conservation Act,1989 (Act No.73 of 1989) and does not exempt the holder thereof from compliance with any other legislation.

3.3.2 This authorisation refers only to the activities as specified and described in the final environmental impact report dated February 2007. Any other activity listed under section 21 of the Environment Conservation Act, 1989 (No. 73 of 1989) which is not specified above, is not covered by this authorisation, and must therefore comply with the requirements of the Environment Conservation Act, Government Notice R 1182 and R.1183 (as amended).

3.3.3 This authorisation is subject to the approval of the relevant local authorities in terms of any legislation administered by those authorities.

3.3.4 The applicant must, within 7 (seven) calendar days of receipt of this record of decision inform all interested and affected parties and at least include the following:

(i) That an authorisation has been issued to the applicant to proceed with the construction and operation of the activity. If requested, provide copies of this ROD.

(ii) That any appeals against the issuing of the authorisation must be lodged with the Minister of Environmental Affairs and Tourism within 30 (thirty) days from the date on which this ROD has been issued to the applicant at the address stipulated in this ROD.

(iii) That an appeal questionnaire may be used in the lodging of an appeal. It is obtainable from the Department's offices at tel. (012) 310 3590 or e-mail: cveeden@deat.gov.za.

(iv) The date on which the ROD was issued to the applicant in terms of regulation 10(1) and the date by which appeals must reach the Minister.

Failure to inform interested and affected parties within the stipulated time period may result in the Minister considering requests from such parties for permission to submit a late appeal favourably.

3.3.5 One week's written notice must be given to this Department before commencement of construction activities. Such notice shall make clear reference to the site location details and reference number given above.

3.3.6 One week's written notice must be given to this Department before commencement of operation activities. Such notice shall make clear reference to the site location details and reference number given above.

3.3.7 The applicant shall be responsible for ensuring compliance with the conditions contained in this ROD by any person acting on his behalf, including but not limited to, an agent, servant, or employee or any person rendering a service to the applicant in respect of the activity, including but not limited to, contractors and consultants.

3.3.8 The applicant must notify the Department in writing, within 24 (twenty four) hours if any condition of this authorisation cannot, or is not, adhered to. The notification must be supplemented with reasons for non-compliance.

3.3.9 A copy of the authorisation and ROD shall be available on site during construction and all staff, contractors and sub-contractors shall be familiar with or be made aware of the contents of this authorisation and ROD.

3.3.10 Compliance/non-compliance records must be kept and shall be made available on request from the authorities within five days of receipt of the request.

3.3.11 Any changes to, or deviations from, the project description set out in this letter must be approved, in writing, by the Department before such changes or deviations may be effected. In assessing whether to grant such approval or not, the Department may request such information as it deems necessary to evaluate the significance and impacts of such changes or deviations.

3.3.12 This Department may review the conditions contained in this letter from time to time and may, by notice in writing to the applicant, amend, add or remove a condition.

3.3.13 In the event that the predicted impacts exceed the significance as predicted by the independent consultant in the final environmental impact report dated February 2007, the authorisation may be withdrawn after proper procedures have been followed.

3.3.14 In the event of any dispute concerning the significance of a particular impact, the opinion of the Department of Environmental Affairs and Tourism (DEAT) in respect of its significance will prevail.

3.3.15 The applicant must notify the Department, in writing, at least 10 (ten) days prior to the change of ownership, project developer or the alienation of any similar rights for the activity described in this letter. The applicant must furnish a copy of this document to the new owner, developer or person to whom the rights accrue and inform the new owner, developer or person to whom the rights accrue that the conditions contained herein are binding on them.

3.3.16 Where any of the applicant's contact details change, including the name of the responsible person, the physical or postal address and/or telephonic details, the applicant must notify the Department as soon as the new details become known to the applicant.

3.3.17 National government, provincial government, local authorities or committees appointed in terms of the conditions of this application or any other public authority or authorisation shall not be held responsible for any damages or losses suffered by the applicant or his successor in title in any instance where construction or operation subsequent to construction be temporarily or permanently stopped for reasons of non-compliance by the applicant with the conditions of approval as set out in this document or any other subsequent document emanating from these conditions of approval.

3.3.18 If any condition imposed in terms of this authorisation is not complied with, the authorisation may be withdrawn after 30 days written notice to the applicant in terms of section 22(4) of the Environment Conservation Act, 1989 (Act No. 73 of 1989).

3.3.19 Failure to comply with any of these conditions shall also be regarded as an offence and may be dealt with in terms of sections 29, 30 and 31 of the Environment Conservation Act, 1989 (Act No. 73 of 1989), as well as any other appropriate legal mechanisms.

3.3.20 The applicant shall be responsible for all costs necessary to comply with the above conditions unless otherwise specified.

3.3.21 Any complaint from the public during construction must be attended to as soon as possible to the satisfaction of the parties concerned. A complaints register must be kept up to date and shall be produced upon request.

3.3.22 Departmental officials shall be given access to the properties earmarked for construction activities for the purpose of assessing and/or monitoring compliance with the conditions contained in this document at all reasonable times.

3.3.23 All outdoor advertising associated with this activity, whether on or off the property concerned, must comply with the South African Manual for Outdoor Advertising Control (SAMOAC) available from this Department.

3.4 DURATION OF AUTHORISATION

If the activity authorised by this letter does not commence within 4 (four) years from the date of signature of this letter, the authorisation will lapse and the applicant will need to reapply for exemption or authorisation in terms of the above legislation or any amendments thereto or any subsequent new legislation.

4. CONSEQUENCES OF NON-COMPLIANCE

The applicant must comply with the conditions set out in this letter. Failure to comply with any of the above conditions may result in, *inter alia*, the Department withdrawing the authorisation, issuing directives to address the non-compliance – including an order to cease the activity – as well as instituting criminal and/or civil proceedings to enforce compliance.

5. APPEALS

Appeals in respect of this decision must be lodged with the Minister of Environmental Affairs and Tourism within 30 (thirty) days of the date of this decision. Appeals can be submitted utilising one of the following methods:

By facsimile:	(012) 322 0082
By post:	Private Bag X447, Pretoria 0001
By hand:	2nd Floor, Fedsure Forum Building, North Tower, cor. Van der Walt and Pretorius Streets, Pretoria.

Appeals must comply with the provisions of Regulation 11 of Government Notice No. R. 1183 which reads as follows:
"An appeal to the Minister or provincial authority under section 35(3) of the Act must be done in writing within 30 days from the date on which the ROD was issued to the applicant in terms of regulation 10(1);
An appeal must set out all the facts as well as the grounds of appeal, and must be accompanied by all relevant documents or copies of them which are certified as true by a commissioner of oaths."

An appeal questionnaire may be used in the lodging of an appeal. It is obtainable from the Department's offices at tel. (012) 310 3590 or e-mail: cveeden@deat.gov.za.

Should the applicant wish to appeal any aspect of this decision, the applicant must notify and furnish copies of the appeal which will be submitted to the Minister, to all registered interested and affected parties. Proof of such notification must be submitted to the Minister with the appeal. Failure to comply with this provision may result in the Minister refusing to consider the appeal.

6. APPLICANT:

Eskom Holdings Limited: Generation Division
P O Box 1091
JOHANNESBURG
2000

Contact person: Ms Deirdre Herbst
Fax: (011) 800 5140

7. **CONSULTANT:**

Ninham Shand Consulting Services
P O Box 509
GEORGE
6530

Contact person: Brett Lawson
Fax: (044) 874-2165

Ms Pam Yako
Director – General
Department of Environmental Affairs and Tourism
Date: 05/07/07

MINISTRY: ENVIRONMENTAL AFFAIRS AND TOURISM
REPUBLIC OF SOUTH AFRICA
Private Bag X447, Pretoria, 0001, Tel: (27-12) 310 3611, Fax: (27-12) 322 0082
Private Bag X9154, Cape Town, 8000 Tel: (27-21) 465 7240/1/2, Fax: (27-21) 465 3216
www.deat.gov.za

Mr T Singleton
Eskom Holdings Limited: Generation Division
P O Box 1091
JOHANNESBURG
2000

Fax no. 011 800 5140

Dear Mr Singleton

RE: RECORD OF DECISION FOR PROJECT REFERENCE 12/12/20/807: CONSTRUCTION OF THE ESKOM GENERATION PROPOSED 5400MW COAL-FIRED POWER STATION, WITBANK

The Minister of Environmental Affairs and Tourism, Mr Marthinus van Schalkwyk, has considered the appeals against the Department's decisions to grant authorisation to the applicant for the construction of the proposed 5400mw coal-fired power station, Witbank (Project Bravo).

After evaluating all the appeals and relevant information submitted to him, he has come to a decision as attached hereto.

Sincerely,

RIAAN AUCAMP
ACTING: HEAD OF MINISTRY

17 MAR 2008

MINISTRY FOR ENVIRONMENTAL AFFAIRS AND TOURISM

Ref: 12/12/20/807

APPEAL DECISION

MINISTER OF ENVIRONMENTAL AFFAIRS AND TOURISM

APPEALS AGAINST THE ENVIRONMENTAL AUTHORISATION FOR THE CONSTRUCTION OF A 5400MW COAL-FIRED POWER STATION IN WITBANK

1. INTRODUCTION

The project in question involves the construction of a 5400MW coal-fired power station and associated infrastructure near Witbank, on approximately 2500ha of land on the Farm Hartbeesfontein 537 JR and the Farm Klipfontein 566 JR.

2. BACKGROUND

The development that is the subject of this appeal entails the erection of a 5400MW coal-fired power station and its components and associated infrastructure listed below:

2.1 Power Station Precinct

i) Power station buildings;

ii) Administrative buildings (control buildings, medical, security etc);

iii) High voltage yard.

2.2 Associated Infrastructure

i) Coal stock yard;

ii) Coal and ash conveyors;

iii) Water supply pipelines (temporary and permanent);

iv) Water and wastewater treatment facilities;

v) Ash disposal system;

vi) Access roads (including haul roads);

vii) Dams for water storage; and

viii) Railway siding and/or line for sorbent supply.

2.3 The applicant in this project is Eskom Holdings Ltd, Generation Division (Eskom).

2.4 In terms of the environmental impact assessment (EIA) regulations conducted under the Environment Conservation Act, 1989 (Act 73 of 1989) [ECA]), and which Act still governs this project, the construction of a facility of this nature is subject to EIA and an environmental authorisation.

2.5 The development was authorised by the Director-General and a positive record of decision (ROD) was granted in respect of this development on 5 June 2007. Two appeals, in terms of section 35(3) of the Environment Conservation Act, 1989, were received by my office against the proposed project.

3. APPEALS

3.1 The appellants

After the ROD in this matter was issued, my office received two appeals from Mr J H van der Merwe, a local landowner and farmer, and from the Kendal Poultry Farm (Pty) Ltd, represented by its attorneys, J B Hugo & Cronje, respectively.

3.2 Grounds of appeal

The grounds of appeal are briefly listed below:

a) No consultation

According to Mr Van der Merwe, he was not consulted regarding the project.

b) Impact of the ash dump

The same appellant referred to in (a) above submits that the ash dump will be detrimental to the health of his family and his farm animals.

c) Impact on the appellant's normal way of life and living on the farm

Mr Van der Merwe avers that the proposed power station will impact on the normal way of life of his family on the farm.

d) Cumulative environmental impact assessment (EIA) not done

It is the submission of Kendal Poultry that an assessment was not done with regard to the cumulative impact of the proposed power station and the proposed Anglo Coal Mine.

e) Adverse air impact.

Kendal Poultry alleges that there will be adverse air impact on its poultry farm, which will detrimentally affect the health of its chickens.

f) Socio-economic impacts

According to Kendal Poultry, there will be potential negative socio-economic impacts. The appellant states that its staff component of 110 persons and their many dependants are deeply affected and concerned as to their future jobs and their health, being in such close proximity to the proposed power station.

g) Impacts on water quality

Kendal Poultry submits that there will be impacts on the quality of the water from its boreholes, of which a large quantity is used on the poultry farm for various purposes.

4. DECISION

4.1 INFORMATION CONSIDERED

In reaching my decision, I have considered the following information:

- The project file in this matter, including the ROD granted on 5 June 2007;
- The appeals lodged against this development, the response thereto by Eskom's consultants and one appellant's reply thereto; and
- The department's responses to the grounds of appeal.

4.2 DECISION

4.1 I have, in terms of section 35(4) of ECA, decided to dismiss the appeals lodged against the decision to grant the environmental authorisation for the construction of the proposed power station and its associated infrastructure. The reasons for my decision are set out below.

4.2 I have further decided to vary the authorisation issued by the Department and attach the revised authorisation hereto as Annexure B. More specifically, I have added conditions to the following effect:

(a) The applicant, in consultation with the relevant appellant must, on a quarterly basis, monitor the reproductive health of the poultry on the Appellant's farm and if it is conclusively established that there is a causal connection between

the emissions from the power station and any deterioration in the health of the chickens, corrective measures must be implemented by the applicant;

(b) The applicant must establish an ambient air quality monitoring station to monitor the ambient air impact of the power station.

The revised ROD has been supplemented accordingly.

4.3 REASONS FOR THE DECISION

I indicate briefly the reasons for my decision to authorise this development. In doing so, I am satisfied that:

(a) There was sufficient consultation in this matter and that the legislative requirements in this regard have been satisfied;

(b) The need and desirability for the project has been adequately demonstrated. The proposed project is part of the applicant's new capacity installation programme and is intended to meet some of the pressing electricity demands of the country;

(c) The Director-General adequately considered the major anticipated environmental impacts of this development before issuing the environmental authorisation on 5 June 2007;

(d) The potential impacts on human and animal health from the ash dump can be mitigated to acceptable levels through the conditions set by the authorisation and other measures, but that additional measures must be put in place to ensure adequate monitoring of air quality. I have also taken note in my analysis of the information before me that the proposed power station will be located within the newly proclaimed Highveld Priority Area. It is therefore envisaged that detailed air quality management interventions will be made within the area to generally improve ambient air quality. In addition, I am satisfied that the technology utilized for this development conforms to international best practice standards and will set the standard for similar developments in this country in future;

(e) The conditions included in the revised ROD are deemed adequate to provide for the mitigation of the identified impacts to acceptable levels;

(f) The development will result in socio-economic benefits, not only to the Witbank area, but to the country as a whole.

(g) By implementing the mitigation measures contained in this revised ROD, the principles contained in section 2 of the National Environmental Management Act, 1998 (Act 107 of 1998, NEMA) can be substantially complied with.

I however reserve the right to amplify my reasons for this decision should the need arise.

Marthinus van Schalkwyk

MARTHINUS VAN SCHALKWYK, MP

MINISTER OF ENVIRONMENTAL AFFAIRS AND TOURISM

DATE: 17 MAR 2008

ANNEXURE B

RECORD OF DECISION

RECORD OF DECISION FOR PROJECT REFERENCE 12/12/20/807: CONSTRUCTION OF THE ESKOM GENERATION PROPOSED 5400MW COAL-FIRED POWER STATION, WITBANK

By virtue of the power vested in me in terms of section 35(4) of the Environment Conservation Act,1989 (Act 73 of 1989) ("the Act"), read with section 22(3) of the Act, I hereby authorise Eskom Holdings Limited to undertake the activities specified/ detailed below subject to the indicated conditions.

1. DESCRIPTION, EXTENT AND LOCATION OF THE ACTIVITY:

The proposed development will include the construction of a 5400MW coal-fired power station and associated infrastructure near Witbank, on approximately 2500ha of the Farm Hartbeestfontein 537 JR and the Farm Klipfontein 566 JR. Site X, as indicated on page 2 of the Final Environmental Impact Report (Ninham Shand Report No. 4284/401281, dated February 2007), was identified as the preferred site for the proposed coal-fired power station. The proposed site falls within the jurisdiction of Delmas Local Municipality within the Mpumalanga Province.

The proposed project will consist of the establishment of the following components:

- Power station precinct:
  - Power station buildings;
  - Administrative buildings (control buildings, medical, security, etc); and
  - High voltage yard.
- Associated infrastructure:
  - Coal stock yard;
  - Coal and ash conveyors;

- Water supply pipelines (temporary and permanent);
- Water and wastewater treatment facilities;
- Ash disposal systems;
- Access roads (including haul roads);
- Dams for water storage; and
- Railway siding and / or line for sorbent supply.

2. CONDITIONS

2.1 Description of the activity

The authorisation applies in respect of the following activities as listed in Schedule 1, regulation R. 1182 and described in Plan of Study for Scoping dated April 2006:

- Item 1: The construction, erection or upgrading of-
  - (a) facilities for commercial electricity generation with an output of at least 10 megawatts and infrastructure for bulk supply;
  - (c) with regard to any substance which is dangerous or hazardous and is controlled by national legislation-
    - (i) infrastructure, excluding road and rails, for the transportation of any such substance; and
    - (ii) manufacturing, storage, handling, treatment or processing facilities for any such substance;
  - (d) roads, railways, airfields and associated structures;
  - (g) structures associated with communication networks, including masts, towers and reflector dishes'
  - (l) schemes for the abstraction or utilisation of ground or surface water for bulk supply purposes;
  - (n) sewage treatment plants and associated infrastructure;

- Item 2: The change of land use from-
  (c) agricultural or zoned undetermined use or an equivalent zoning to any other land use.

- Item 8: The disposal of waste as defined in section 20 of the Act, excluding domestic waste, but including the establishment, expansion, upgrading or closure of facilities for all waste, ashes and building rubble.

3. SPECIFIC CONDITIONS

3.1 Water quality management

3.1.1 All risk reduction recommendations made in the Hydrogeological Assessment, GCS (Pty) Ltd, dated 14 November 2007, must be considered and implemented during the planning and construction of the new power station.

3.1.2 The coal stockyard must be established on top of a suitably prepared surface to prevent leaching into the groundwater.

3.1.3 The area where the ash dump is to be established must be lined to prevent leaching into the groundwater.

3.1.4 Dams with a higher groundwater pollution risk must be sited on appropriate underlying geological strata or these dams must be lined.

3.1.5 All polluted water must be recycled until all pollutants are captured as waste for disposal with the ash deposition.

3.1.6 Eskom must ensure that the metering procedure of water supplied to the proposed power station must measure to a level of accuracy of 0,5%. Water and salt balances must be carried out once a month to verify performance and identify potential problems.

3.1.7 Leak detections and inspections, on site and along pipelines must be implemented.

3.1.8 The cooling water sludge from the cold lime softening process must be co-disposed with the ash.

3.1.9 The sludge removed from raw water storage dams and reservoirs must be used as fill material for borrow pits or to cover for waste sites.

3.1.10 The "dirty" water generated on site and considered for irrigation must be tested to determine its suitability in terms of salinity and sodium absorption ratio (SAR).

3.1.11 Eskom must continuously monitor the ground water quality and implement measures to ensure that pollution of the resource does not occur. The monitoring programme for ground water quality and measures to control and prevent pollution of the ground water resource shall be included in the operational EMP.

3.1.12 A water use licence must be applied for in terms of Section 32 (g) of the National Water Act to adequately deal with the storage of ash from the ash dump and the disposal of wet waste from the Flue Gas Desulphurisation process.

3.2. Management of fauna and flora

3.2.1 A site specific wetland assessment and a rare and endangered species survey must be undertaken during the appropriate season. This must inform the identification of less sensitive areas, for the positioning of corridors for pipelines, roads, railways and coal conveyors. These corridors should be planned in a way that avoids or minimises the impacts on wetlands.

3.2.2 All unavoidable construction within wetland areas must be done so as to minimise disturbance of the pedology which would directly affect subterranean hydrology in wetlands systems.

3.2.3 A revised layout must be submitted indicating how the proposed corridors for the pipelines, roads, railways and coal conveyors have taken the wetlands into consideration during the planning stage of the proposed alignment of these routes. This revised layout must also indicate where the proposed dams for water storage will be constructed.

3.3 Visual impact management

3.3.1 The following design measures must be implemented at the power station to ensure that visual intrusion is kept to the minimum:

- Treat building facades and roofs with a muted, mat paint that is similar to the prevailing colour of the landscape.
- Avoid very light or dark finishings that will increase colour contrast with the foreground and background.
- Reduce the use of reflective building materials such as glass to avoid glare and visual discomfort to viewers.
- Screen planting should be introduced along perimeter roads passing the site, around the coal stockyard and the ash dump to screen views of these project components.
- Avoid over-illumination of outdoor spaces. Low pressure sodium lights are regarded as highly energy efficient and suitable for security lighting.

3.3.2 The existing vegetation cover of the site should be retained through selective clearing. This will ensure that screening takes place during the construction and operational phases of the development.

3.3.3 The ash dump's final slope configuration should avoid sharp angles and straight lines. The slope typically consists of benches and rises. The edges that will be created as a result of these changes in slope should be rounded to create an even light distribution over the edge and avoid distinct, straight shadow lines.

3.4 Noise impact management

3.4.1 The Gauteng and the National Noise Control Regulations, as well as SANS 10103:2004 must be used as the main guidelines to manage the noise impact of this project.

3.4.2 Buildings housing noisy machinery must be insulated in order to minimise the transmission of noise through the walls and roof.

3.4.3 Measures to mitigate noise emanating from the cooling fans must be investigated by an acoustics engineer. Proposed mitigation measures, including the potential to shield the cooling fans must be included in the operational EMPs for consideration and approval by the Department.

3.5 Social risk management

3.5.1 A Quantitative Risk Assessment must be undertaken in terms of the Major Hazardous Installation (MHI) Regulations (July 2001) prior to construction. This risk assessment must be undertaken once the detailed engineering designs and layouts have been developed. The findings of the assessment must be incorporated into the construction Environmental Management Plan (EMP).

3.6 Heritage impact management

3.6.1 All recommendations made and mitigation measures proposed in the Heritage Impact Assessment, National Cultural History Museum, dated October 2006, must be implemented for the nine culturally important identified sites on the property.

3.6.2 The South African Heritage Resource Agency (SAHRA) must be informed if any of these identified culturally important sites are going to be impacted upon by the proposed development.

3.7 Air quality management

3.7.1 Eskom must install, commission and operate any required SO_2 abatement equipment that may be necessary to ensure compliance with any applicable emission or ambient air quality standards published in terms of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004).

3.7.2 Particulate abatement measures such as bag filters or electrostatic precipitators must be implemented at the power station to reduce PM_{10} emissions.

3.7.3 Eskom must initiate a programme of support for initiatives aimed at improving air quality in the Witbank residential area. This programme must be included in the operational EMP.

3.7.4 The power station must be operated in compliance with any related Registration Certificate issued in terms of the Atmospheric Pollution Prevention Act, Act 45 of 1965, and any related Atmospheric Emission License issued in terms of the National Environment Management: Air Quality Act, Act 39 of 2004.

3.7.5 Low NOx burners must be included in the design of the boilers to reduce the NOx levels.

3.7.6 Eskom must indicate the technology to be installed to reduce the emission of mercury into the atmosphere. The percentage and minimum of by how much this reduction will take place must be provided in the construction EMP.

3.7.7 Eskom must install an ambient air quality monitoring station to measure the ambient air impact of the power station. The location of the station and the pollutants to be monitored will be determined in consultation with the Department.

3.7.8 End of pipe measures need to be specific to address the sulphur dioxide and particulates emissions. These measures must include the following:

- For sulphur dioxide – FGD unit
- For particulates – ESP or bag filters
- For carbon dioxide – carbon capture readiness (the Applicant is required to submit to DEAT a report detailing the preferred technology, for approval, before proceeding with construction)

3.8 Traffic impact management

3.8.1 The future proposed alignment of the K29/1 intersects the proposed site. This road alignment must be verified with the Mpumalanga Roads Department before the commencement of the design of access roads to the site.

3.8.2 The internal road network utilised for access to the site must be resurfaced, upgraded or reconstructed as required. Special attention must be given to providing adequate drainage and subsurface drainage systems on all roads.

3.9 Socio-economic impact management

3.9.1 Community forums and communication channels between the local communities, construction companies / contractors and Eskom must be established and maintained.

3.9.2 Assistance must be provided to the inhabitants on site through skills development and job opportunities. Information with regards to this must be included in the environmental compliance report to be undertaken by the Environmental Control Officer (ECO)(refer to 3.2.13.4 below).

3.10 Agricultural impact management

3.10.1 Eskom must provide the Department with an action plan related to the surplus land, not occupied by infrastructure related to the power station which could be leased to farmers for agricultural production. This action plan must be included in the operational EMP.

3.10.2 In order to establish whether the operation of the power station has adverse impacts on the health and reproduction of the chickens of the Kendal Poultry Farm (hereinafter called Kendal Poultry), situated on Portions 30, 31, 62, 27 and 28 of the farm Klipfontein near Witbank, the ECO appointed in terms of paragraph 3.2.13 below must:

(1) During the construction period compile baseline information, in consultation with Kendal Poultry, on chicken fatality and reproduction rates on a quarterly basis. This information must indicate the number of fatalities per 1 000 chickens and the number of new chickens per 1 000 hens. This baseline information must represent statistics for a period of at least one year.

(2) Once the power station has come into operation, resume and continue this quarterly compilation of statistics for at least two years. After expiry of the two year period, Eskom must:

(a) Analyse the pre-operation (baseline) data and the post-operation data to establish whether there has been any increase in chicken fatality or decrease in their reproduction rate.

(b) Undertake appropriate studies, should there be evidence of such increases and decreases, to establish whether there is a causal relation between the fertility and mortality fluctuations and the emissions emanating from the power station. These studies must be undertaken within six months after completion of the gathering of the post-operational data.

3.10.3 Should these studies confirm that such a causal relation exists, Eskom must, within two months after completion of the studies referred to in (2)(b) , submit to the Department for approval:

(a) A management plan to mitigate the impacts of the losses (if any), including but not limited to, compensation for such loss.

3.11 Environmental Monitoring Committee (EMC)

3.11.1 This development is authorised on condition that the developer establishes an EMC with clear terms of reference as described in 3.2.11.6.

3.11.2 Amongst others the EMC shall consist of the following members:

(a) A chairperson as described in 3.2.11.3,
(b) The ecologist that participated in the EIA process, or any other suitably qualified and experienced ecologist approved for this purpose by the Department,
(c) Representatives from the public (at least two people),
(d) Environmental Control Officer (ECO) (once appointed in terms of 3.2.13 below),
(e) A senior site manager from the main contractor, and
(f) An air quality specialist.

3.11.3 The EMC must appoint an independent chairperson who has appropriate people and project management skills.

3.11.4 The EMC must meet on a bi-monthly basis from the inception of the project.

3.11.5 The EMC must report to the Director: Environmental Impact Evaluation of the Department on a bi-monthly basis and the report must include matters as described in 3.2.11.6 below.

3.11.6 The purpose of the EMC is to execute the following:

(a) To monitor and audit compliance with the conditions of this ROD, with environmental legislation and with specific mitigation requirements as stipulated in the environmental impact report and the Environmental Management Plans.

(b) To make recommendations to the Director: Environmental Impact Evaluation on issues related to the monitoring and auditing of the project.

(c) To decide on the frequency of meetings, should a need arise to review the prescribed frequency. This change should be communicated to the Department for acceptance.

3.11.7 All costs associated with the EMC shall be borne by the applicant. The terms of reference for the EMC must, in addition to the scope of work as detailed in 3.2.11.6, clearly define roles and responsibilities related to logistical arrangements, administration and financial arrangements associated with the EMC.

3.11.8 Upon completion of construction, the roles, responsibilities and constitution of the EMC shall be reconsidered and the EMC shall be re-established with new terms of reference for the operational phase of the development.

3.212 Environmental Management Plan (EMP)

3.12.1 Eskom must submit a site specific construction EMP to the relevant authorities for acceptance before commencement of any of the activities related to this authorisation. The EMP must include, but shall not be limited to the following aspects:

- Rehabilitation of all areas disturbed during the construction phase of the project excluding those areas where permanent structures are erected.
- Siting and management of construction camps, sanitation, ablution and housing facilities as well as material storage areas used by the contractor. All work areas must be supplied with proper sanitation facilities.
- Management and rehabilitation of access roads to individual construction areas that will not become permanent roads upon completion of construction. Any new road constructed for any purpose not authorised as part of this ROD, must comply with the relevant SANS codes and permission for construction must be obtained from the Department as required by Schedule 1, item 1 (d) of R. 1182.
- Waste avoidance, minimisation and disposal of waste at an appropriate facility.
- Protection of any heritage sites likely to be impacted on by the development, should such sites be found during any phase of the development of the project.
- Provisions for harvesting of any medicinal plants that may occur on site prior to site clearance.
- Protection of indigenous vegetation where such is not affected by the physical footprint of the power station, ancillary infrastructure or associated construction works.
- Provision for plant search and rescue of protected and endangered species which should be done before commencement of any construction related activity.
- Management of traffic during the construction phase where the site access roads and other transportation networks intersect.
- Measurement, monitoring and management of noise and dust pollution levels during the construction phase.

- A fire control management plan for implementation on site.
- Implementation of site specific erosion, sediment and dust control measures during the construction phase.
- The implementation, as part of the EMP, of all recommendations and mitigation measures contained in the final environmental impact report dated February 2007.

3.12.2 Once accepted by the Department, the revised construction EMP will be seen as a dynamic document. However, any changes to the EMP, must be submitted to the Department for acceptance before such changes could be effected. Such a submission for consideration by the Department must be accompanied by recommendations of the EMC.

3.12.3 Compliance with the accepted construction EMP must form part of all tender documentation for all contractors working on the project and must be endorsed contractually.

3.12.4 Eskom must submit an EMP for the operational phase of the development to the Department and other relevant provincial and local authorities for acceptance prior to the completion of the construction phase and the inception of the operational phase of the development. The revised operational EMP will be seen as a dynamic document. However, any substantial changes to the operational EMP, which is environmentally defendable, must be submitted to the Department for acceptance before such changes are effected.

3.13 Environmental Control Officer (ECO)

3.13.1 The developer must appoint a suitably qualified Environmental Control Officer (ECO) who would, on behalf of the EMC, on a daily basis monitor the project compliance with conditions of this ROD, with environmental legislation and with the recommendations of the EMP. The cost of the ECO shall be borne by the applicant.

3.13.2 The ECO must be appointed one month before the start of construction and the relevant authorities must be notified of such an appointment for communication purposes.

3.13.3 The ECO shall ensure that periodic environmental performance audits are undertaken on the project implementation.

3.13.4 The ECO shall submit an environmental compliance report on a two-monthly basis, in writing, to the Director: Environmental Impact Evaluation of the Department, copied to the Mpumalanga Department of Agriculture and Land Administration.

3.13.5 The ECO shall maintain the following on site:
- A daily site diary
- A non-conformance register
- A public complaint register
- A register of audits

3.13.6 The ECO shall remain employed until all rehabilitation measures as required, caused by construction damage, are completed and the site is handed over to Eskom by the contractor for operation.

3.13.7 The ECO shall report to and be accountable to the EMC.

3.14 Monitoring and auditing

3.14.1 Records relating to monitoring and auditing must be made available for inspection to any relevant authority in respect of this development.

3.14.2 The Department reserves the right to monitor and audit the development throughout its full life cycle to ensure that it complies with the conditions stipulated in the record of decision and to ensure implementation of all the mitigation measures contained in the final environmental impact report dated February 2007, and of the construction and operational EMPs.

3.15 Transportation and handling of hazardous materials.

3.15.1 During the construction of the power station, an effective monitoring system must be put in place to ensure safety and to detect any leakage or spillage of coolants from all oil containing equipment during their transportation, handling and installation.

3.15.2 The transportation and handling of hazardous substances must comply with all the provisions of the Hazardous Substances Act (Act No.15 of 1973) and its regulations as well as with SABS codes 0228 and 0229.

3.16 Rehabilitation after construction

3.16.1 No exotic plant species may be used for rehabilitation purposes. Only indigenous plants may be used.

3.16.2 Measures aimed at controlling invasive plant species and weeds must be implemented and must form part of the relevant EMP.

3.16.3 No disturbance of the land on the edge of any stream, river or wetland is allowed unless such disturbance complies with relevant legislation and conforms to strict design parameters.

3.17 Compliance with other legislation

3.17.1 Archaeological remains, artificial features and structures older than 60 years are protected in terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999). Should any archaeological artefacts be exposed during excavation for the purpose of laying foundations, construction in the vicinity of the finding must be stopped. An archaeologist must be called to the site for inspection. Under no circumstances shall any

artefacts be destroyed or removed from the site. SAHRA must be contacted to this effect. Their recommendations should be included in the construction EMP and be adhered to.

3.17.2 All provisions of the Occupational Health and Safety Act, 85 of 1993, and any other applicable legislation must be adhered to by the holder of this authorisation.

3.17.3 All provisions of the National Water Act, Act 36 of 1998, must be adhered to by the holder of this authorisation.

3.17.4 All provisions of the National Environment Management: Air Quality Act, Act 39 of 2004, must be adhered to by the holder of this authorisation.

3.17.5 All provisions of the Atmospheric Pollution Prevention Act, Act 45 of 1965, must be adhered to by the holder of this authorisation.

3.17.6 All provisions of the National Environment Management: Biodiversity Act, Act 10 of 2004, must be adhered to by the holder of this authorisation.

3.17.7 Should fill material be required for any purpose, the use of borrow pits must comply with the provisions of the Minerals and Petroleum Resources Development Act, 28 of 2002 administered by the Department of Minerals and Energy.

3.17.8 A permit shall be obtained from the provincial department of nature conservation for the removal of indigenous protected and endangered plant and animal species.

3.18 GENERAL CONDITIONS

3.18.1 This ROD is issued only in terms of section 22 of the Act and does not exempt the holder thereof from compliance with any other legislation.

3.18.2 This ROD only refers to the activities as specified and described in the final environmental impact report dated February 2007. Any other activity listed under section 24(2) of the National Environmental Management Act, 1998 (Act 107 of 1998), which is not specified above, is not covered by this ROD.

3.18.3 This ROD is subject to the approval of the relevant local authorities in terms of any legislation administered by those authorities.

3.18.4 One week's written notice must be given to the Department before commencement of construction activities. Such notice shall make clear reference to the site location details and reference number given above.

3.18.5 One week's written notice must be given to the Department before commencement of operational activities. Such notice shall make clear reference to the site location details and reference number given above.

3.18.6 The applicant shall be responsible for ensuring compliance with the conditions contained in this ROD by any person acting on its behalf, including but not limited to, an agent, servant, or employee or any person rendering a service to the applicant in respect of the activity, including but not limited to, contractors and consultants.

3.18.7 The applicant must notify the Department in writing, within 24 hours, if any condition of this ROD cannot, or is not, adhered to. The notification must be supplemented with reasons for such non-compliance.

3.18.8 A copy of this ROD shall be available on site during construction and all staff, contractors and sub-contractors shall be familiar with or be made aware of the contents thereof.

3.18.9 Compliance/non-compliance records must be kept and shall be made available on request from the authorities within five days of receipt of the request.

3.18.10 Any changes to, or deviations from, the project description set out in this ROD must be approved, in writing, by the Department before such changes or deviations may be effected. In assessing whether to grant such approval or not, the Department may request such information as it deems necessary to evaluate the significance and impacts of such changes or deviations.

3.18.11 This Department may review the conditions contained in this ROD from time to time and may, by notice in writing to the applicant, amend, add or remove a condition.

3.18.12 In the event of impacts exceeding the significance predicted by the independent consultant in the final environmental impact report dated February 2007, this authorisation may be withdrawn after proper procedures have been followed.

3.18.13 In the event of any dispute concerning the significance of a particular impact, the opinion of the Department will prevail.

3.18.14 The applicant must notify the Department, in writing, at least ten days prior to the change of ownership, project developer or the alienation of any similar rights for the activity described in this ROD. The applicant must furnish a copy of this document to the new owner, developer or person to whom the rights accrue and inform the new owner, developer or person to whom the rights accrue that the conditions contained herein are binding on them.

3.18.15 Where any of the applicant's contact details change, including the name of the responsible person, the physical or postal address and/or telephonic details, the applicant must notify the Department as soon as possible.

3.18.16 National, provincial or local government institutions or committees appointed in terms of the conditions of this authorisation or any other public authority shall not be held responsible for any damages or losses suffered by the applicant or his successor in title in any instance where construction or operation subsequent to construction is temporarily or permanently stopped for reasons of non-compliance by the applicant with the conditions of approval as

set out in this document or any other subsequent document emanating from these conditions of approval.

3.18.17 If any condition imposed in terms of this authorisation is not complied with, the authorisation may be withdrawn after 30 days written notice to the applicant in terms of section 22(4) of the Act.

3.18.18 Failure to comply with any of these conditions shall also be regarded as an offence and may be dealt with in terms of sections 29, 30 and 31 of the Act, as well as in terms of any other appropriate legislation.

3.18.19 The applicant shall be responsible for all costs necessary to comply with the above conditions unless otherwise specified.

3.18.20 Any complaint from the public during construction must be attended to as soon as possible to the Satisfaction of the parties concerned. A complaints register must be kept up to date and shall be produced upon request.

3.18.21 Departmental officials shall be allowed access at all reasonable times to the properties earmarked for construction activities for the purpose of assessing and/or monitoring compliance with the conditions contained in this document.

3.18.22 All outdoor advertising associated with this activity, whether on or off the property concerned, must comply with the South African Manual for Outdoor Advertising Control (SAMOAC), which is available from the Department.

4 DURATION OF AUTHORISATION

If the activity authorised by this letter does not commence within four years from the date of signature of this ROD, the authorisation will lapse and the applicant will need to reapply for exemption or authorisation in terms of the above legislation or any amendments thereto or any subsequent new legislation.

5. CONSEQUENCES OF NON-COMPLIANCE

The applicant must comply with the conditions set out in this ROD. Failure to comply with any of the above conditions may result in, *inter alia*, the withdrawal of the authorisation, the issuing of directives to address the non-compliance – including an order to cease the activity – as well as the institution of criminal and/or civil proceedings to enforce compliance.

6. APPLICANT:

Eskom Holdings Limited: Generation Division
P O Box 1091
JOHANNESBURG
2000

Contact person: Ms Deirdre Herbst
Fax: (011) 800 5140

7. **CONSULTANT:**

Ninham Shand Consulting Services
P O Box 509
GEORGE
6530

Contact person: Brett Lawson
Fax: (044) 874-2165

Marthinus van Schalkwyk

MARTHINUS VAN SCHALKWYK
MINISTER OF ENVIRONMENTAL AFFAIRS AND TOURISM
DATE: 17 MAR 2008

QUESTIONNAIRE

PURPOSE: TO OBTAIN THE UNDERSTANDING OF COMPLYING WITH THE EA CONDITIONS BY THE PROJECT IMPLEMENTERS AT ESKOM'S KUSILE AND MEDUPI POWER STATIONS CONSTRUCTION PHASES

NATURE AND PURPOSE OF THE STUDY

The research study focuses on the effectiveness of implementing environmental authorisations by Medupi and Kusile Power Stations on their construction phases. The environmental authorisations (EA) are issued to project developments to ensure that environmental impacts as identified during the EIA process are avoided and/or minimized at both project construction and operational phases. The EA set out conditions which the development has to comply with to protect the environment for promoting sustainable development. The reason for this research is to determine the effectiveness of complying with the EA of these power stations.

Section A: PROFILE

1. Gender (Please indicate your choice with an "X").

Male	Female
	X

2. Number of years at Kusile Power Station, construction site.

0 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7
		X				

What function do you currently perform?

- Environmentalist ☐
- Engineer ☑
- Project Manager/Coordinator ☐
- Senior Manager / Management ☐

- Ground worker ☐

SECTION B: QUESTIONS

The following set of questions describes your general perception towards the Environmental Authorisation conditions for Kusile Power Station. For each question, please indicate to which extent you agree or disagree. Please indicate your choice with an "X".

What is your perception towards the Environmental Authorisation conditions for Kusile power station? Please indicate your choice with an "X".	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. Are you aware of the Environmental Authorisation conditions for Kusile?		X			
2. Do you understand the purpose and importance of compliance to Environmental Authorisation conditions					
3. Have you implemented the Environmental Authorisation?					
4. Complying with Environmental Authorisation is waste of time				X	
5. It is impossible to comply with all the conditions of the Environmental Authorisation			X		
6. Most/some of the Environmental Authorisation conditions are - insignificant,				X	
- irrelevant and				X	
- impractical				X	

7. All of the Environmental Authorisation conditions are - significant		X			
- relevant, and			X		
- practical			X		
8. Complying with all Environmental Authorisation conditions will promote/ensure sustainable development		X			
9. Environmental Authorisation is a good tool to ensure that project detrimental impacts are avoided and/or minimised		X			

Kindly provide a detailed suggestion or comment that you think may be useful towards compliance with Environmental Authorisation.

- I feel that more training and awareness is required so all parties are involved before an incident occurs.
- Policies must be looked at to ensure that they are addressing practical, real issues and not causing unwanted delays due to formalities.

THANK YOU

UNISA

CONSENT FORM

TITLE OF RESEARCH PROJECT

A Review of the Environmental Authorization process followed during the construction of Eskom's Kusile and Medupi Power Stations, South Africa.

Dear Mr/Mrs/Miss/(Ms) Robin Rogers Date 30/07/2015

NATURE AND PURPOSE OF THE STUDY

Environmental Authorisations are issued to project developments to ensure that environmental impacts as identified during the EIA process are avoided and/or minimized at both project construction and operational phases. The EA set out conditions which the development has to comply with to protect the environment for promoting sustainable development. The reason for this research is to determine the effectiveness of complying with the EA. If is just for the sake of complying with written conditions as per legislation or towards promoting sustainable development by minimizing the development impacts on the environment.

RESEARCH PROCESS

The study requires your participation in the following manner:

1. You will be required to complete a questionnaire.
2. The questionnaire may be discussed with you in an interview format for easy completion.
3. The questionnaire should be completed within 3 weeks.
4. There are no right or wrong answers and all opinions will be valued.
5. You do not need to prepare anything in advance to answer the questionnaire.
6. All participants will be given the opportunity to express an opinion, or agree or disagree with the opinion.

NOTIFICATION THAT PHOTOGRAPHIC MATERIAL, TAPE RECORDINGS, ETC WILL BE REQUIRED (Taking of photographs)

Your attention is drawn to the fact that the questionnaire interviews will be photographed to ensure that proof of those interviews are kept. You may request and/or scrutinise the photographs taken during interviews or site visits that you participated in.

CONFIDENTIALITY

The opinions of all the participants are viewed as strictly confidential, and only members of the research team will have access to the information. No data published in dissertations and journals will contain any information thorugh which participant members may be identified. Your anonymity is therefore ensured.

WITHDRAWAL CLAUSE

I understand that I may withdraw from the study participation at any time. I therefore participate voluntarily until such time as I request otherwise.

POTENTIAL BENEFITS OF THE STUDY

The study will determine whether the implementation of EA conditions is prioritised by projects/developments, complied with fully and ensure that sustainable development is at the forefront of developments that obtained EA's. The study will further illustrate the effectiveness or ineffectiveness of implementing the EA conditions for avoiding and/or minimizing further environmental damage as predicted or identified during the EIA phase of such projects.

INFORMATION

If I have any queries concerning the study, I may contact the supervisor, Prof Moja, at the Department of Environmental Sciences, Florida Campus, Unisa, Tel: 011 471 3878.

CONSENT

I, the undersigned, Robin Rogers (full name) have read the above information relating to the project and have also heard the verbal version, and declare that I understand it. I have been afforded the opportunity to discuss relevant aspects of the project with the project leader, and hereby declare that I agree voluntarily to participate in the project.

I indemnify the university and any employee or student of the university against any liability that I may incur during the course of the project.

I further undertake to make no claim against the university in respect of damages to my person or reputation that may be incurred as a result of the project/trial or through the fault of other participants, unless resulting from negligence on the part of the university, its employees or students.

I have received a signed copy of this consent form.

Signature of participant: Robin Rogers

Signed at Kusile Power Station on 30/Jul/2015

WITNESSES

1 .....

2 .....

QUESTIONNAIRE

PURPOSE: TO OBTAIN THE UNDERSTANDING OF COMPLYING WITH THE EA CONDITIONS BY THE PROJECT IMPLEMENTERS AT ESKOM'S KUSILE AND MEDUPI POWER STATIONS CONSTRUCTION PHASES

NATURE AND PURPOSE OF THE STUDY

The research study focuses on the effectiveness of implementing environmental authorisations by Medupi and Kusile Power Stations on their construction phases. The environmental authorisations (EA) are issued to project developments to ensure that environmental impacts as identified during the EIA process are avoided and/or minimized at both project construction and operational phases. The EA set out conditions which the development has to comply with to protect the environment for promoting sustainable development. The reason for this research is to determine the effectiveness of complying with the EA of these power stations.

Section A: PROFILE

1. Gender (Please indicate your choice with an "X").

Male	Female
X	

2. Number of years at Kusile Power Station, construction site.

0 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7
		X				

What function do you currently perform?

- Environmentalist ☐
- Engineer ☒
- Project Manager/Coordinator ☐
- Senior Manager / Management ☐

- Ground worker ☐

SECTION B: QUESTIONS

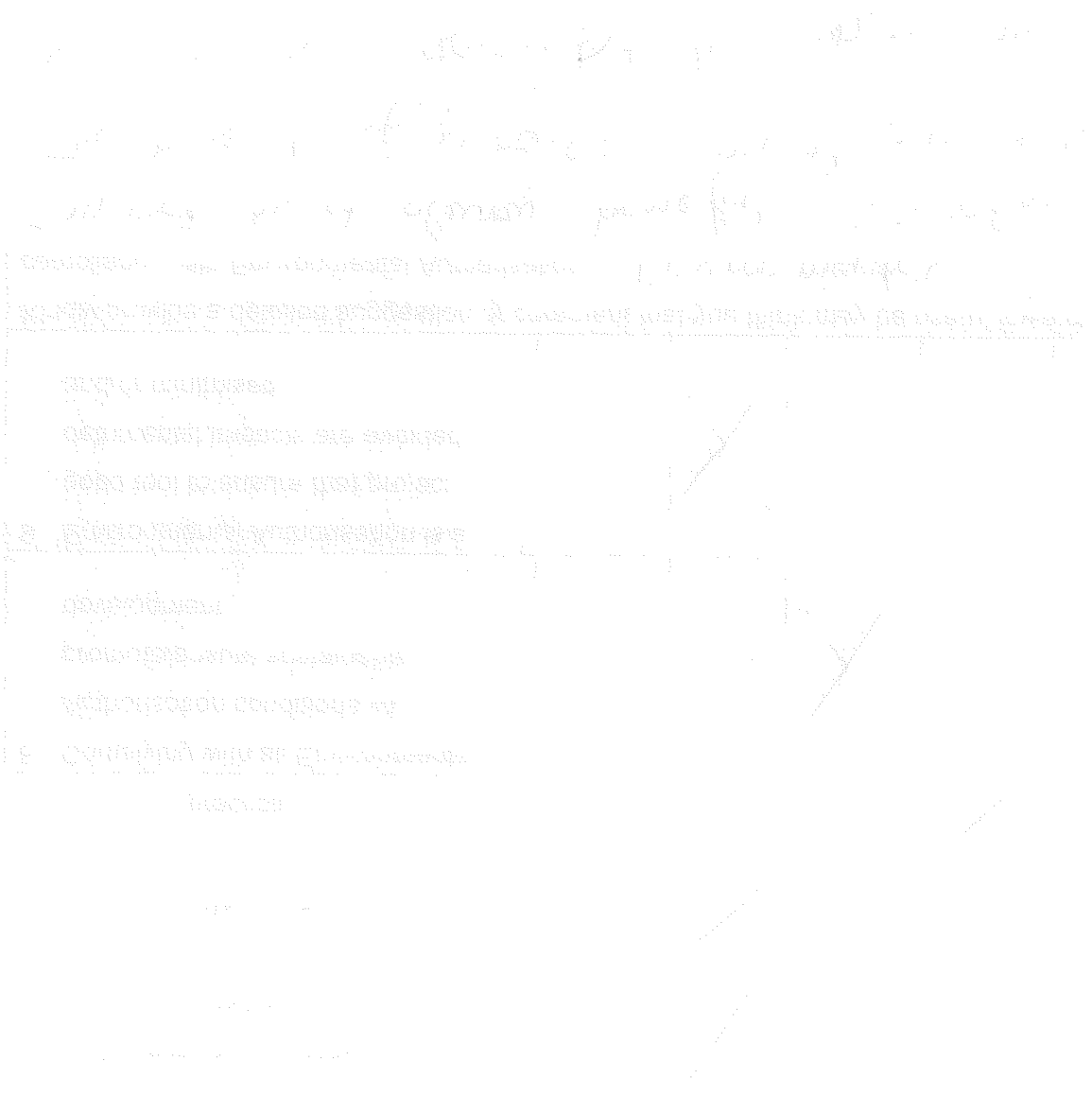
The following set of questions describes your general perception towards the Environmental Authorisation conditions for Kusile Power Station. For each question, please indicate to which extent you agree or disagree. Please indicate your choice with an "X".

What is your perception towards the Environmental Authorisation conditions for Kusile power station? Please indicate your choice with an "X".	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. Are you aware of the Environmental Authorisation conditions for Kusile?		X			
2. Do you understand the purpose and importance of compliance to Environmental Authorisation conditions	X				
3. Have you implemented the Environmental Authorisation?			X		
4. Complying with Environmental Authorisation is waste of time				X	
5. It is impossible to comply with all the conditions of the Environmental Authorisation				X	
6. Most/some of the Environmental Authorisation conditions are - insignificant,				X	
- irrelevant and				X	
- impractical		X			

7. All of the Environmental Authorisation conditions are - significant		X			
- relevant, and		X			
- practical				X	
8. Complying with all Environmental Authorisation conditions will promote/ensure sustainable development			X		
9. Environmental Authorisation is a good tool to ensure that project detrimental impacts are avoided and/or minimised		X			

Kindly provide a detailed suggestion or comment that you think may be useful towards compliance with Environmental Authorisation. Environmental Impact must always benefit civilisation. The benefits of progress must quantitatively be assessed against the environment & sound decisions made.

THANK YOU



UNISA

CONSENT FORM

TITLE OF RESEARCH PROJECT

A Review of the Environmental Authorization process followed during the construction of Eskom's Kusile and Medupi Power Stations, South Africa.

Dear Mr/~~Mrs/Miss/Ms~~ Ganishwar Arunkumar Date 30/07/2015.

NATURE AND PURPOSE OF THE STUDY

Environmental Authorisations are issued to project developments to ensure that environmental impacts as identified during the EIA process are avoided and/or minimized at both project construction and operational phases. The EA set out conditions which the development has to comply with to protect the environment for promoting sustainable development. The reason for this research is to determine the effectiveness of complying with the EA. If is just for the sake of complying with written conditions as per legislation or towards promoting sustainable development by minimizing the development impacts on the environment.

RESEARCH PROCESS

The study requires your participation in the following manner:

1. You will be required to complete a questionnaire.
2. The questionnaire may be discussed with you in an interview format for easy completion.
3. The questionnaire should be completed within 3 weeks.
4. There are no right or wrong answers and all opinions will be valued.
5. You do not need to prepare anything in advance to answer the questionnaire.
6. All participants will be given the opportunity to express an opinion, or agree or disagree with the opinion.

NOTIFICATION THAT PHOTOGRAPHIC MATERIAL, TAPE RECORDINGS, ETC WILL BE REQUIRED (Taking of photographs)

Your attention is drawn to the fact that the questionnaire interviews will be photographed to ensure that proof of those interviews are kept. You may request and/or scrutinise the photographs taken during interviews or site visits that you participated in.

CONFIDENTIALITY

The opinions of all the participants are viewed as strictly confidential, and only members of the research team will have access to the information. No data published in dissertations and journals will contain any information thorugh which participant members may be identified. Your anonymity is therefore ensured.

WITHDRAWAL CLAUSE

I understand that I may withdraw from the study participation at any time. I therefore participate voluntarily until such time as I request otherwise.

POTENTIAL BENEFITS OF THE STUDY

The study will determine whether the implementation of EA conditions is prioritised by projects/developments, complied with fully and ensure that sustainable development is at the forefront of developments that obtained EA's. The study will further illustrate the effectiveness or ineffectiveness of implementing the EA conditions for avoiding and/or minimizing further environmental damage as predicted or identified during the EIA phase of such projects.

INFORMATION

If I have any queries concerning the study, I may contact the supervisor, Prof Moja, at the Department of Environmental Sciences, Florida Campus, Unisa, Tel: 011 471 3878.

CONSENT

I, the undersigned, Ganishwar ARUNKUMAR (full name) have read the above information relating to the project and have also heard the verbal version, and declare that I understand it. I have been afforded the opportunity to discuss relevant aspects of the project with the project leader, and hereby declare that I agree voluntarily to participate in the project.

I indemnify the university and any employee or student of the university against any liability that I may incur during the course of the project.

I further undertake to make no claim against the university in respect of damages to my person or reputation that may be incurred as a result of the project/trial or through the fault of other participants, unless resulting from negligence on the part of the university, its employees or students.

I have received a signed copy of this consent form.

Signature of participant: .....

Signed at Kwsile on 30/07/2015

WITNESSES

1 .....

2 .....

QUESTIONNAIRE

PURPOSE: TO OBTAIN THE UNDERSTANDING OF COMPLYING WITH THE EA CONDITIONS BY THE PROJECT IMPLEMENTERS AT ESKOM'S KUSILE AND MEDUPI POWER STATIONS CONSTRUCTION PHASES

NATURE AND PURPOSE OF THE STUDY

The research study focuses on the effectiveness of implementing environmental authorisations by Medupi and Kusile Power Stations on their construction phases. The environmental authorisations (EA) are issued to project developments to ensure that environmental impacts as identified during the EIA process are avoided and/or minimized at both project construction and operational phases. The EA set out conditions which the development has to comply with to protect the environment for promoting sustainable development. The reason for this research is to determine the effectiveness of complying with the EA of these power stations.

Section A: PROFILE

1. Gender (Please indicate your choice with an "X").

Male	Female
✓	

2. Number of years at Kusile Power Station, construction site.

0 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7
		✓				

What function do you currently perform?

- Environmentalist ☐
- Engineer ☑
- Project Manager/Coordinator ☐
- Senior Manager / Management ☐

- Ground worker

SECTION B: QUESTIONS

The following set of questions describes your general perception towards the Environmental Authorisation conditions for Kusile Power Station. For each question, please indicate to which extent you agree or disagree. Please indicate your choice with an "X".

What is your perception towards the Environmental Authorisation conditions for Kusile power station? Please indicate your choice with an "X".	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. Are you aware of the Environmental Authorisation conditions for Kusile?			✓		
2. Do you understand the purpose and importance of compliance to Environmental Authorisation conditions		✓			
3. Have you implemented the Environmental Authorisation?				✓	
4. Complying with Environmental Authorisation is waste of time			✓		
5. It is impossible to comply with all the conditions of the Environmental Authorisation		✓			
6. Most/some of the Environmental Authorisation conditions are - insignificant,					
- irrelevant and					
- impractical		✓			

7. All of the Environmental Authorisation conditions are - significant					
- relevant, and			✓		
- practical					
8. Complying with all Environmental Authorisation conditions will promote/ensure sustainable development			✓		
9. Environmental Authorisation is a good tool to ensure that project detrimental impacts are avoided and/or minimised		✓			
Kindly provide a detailed suggestion or comment that you think may be useful towards compliance with Environmental Authorisation.					

THANK YOU

CONSENT FORM

TITLE OF RESEARCH PROJECT

A Review of the Environmental Authorization process followed during the construction of Eskom's Kusile and Medupi Power Stations, South Africa.

Dear Mr/Mrs/Miss/Ms Calvin Langley Date 30/07/2015

NATURE AND PURPOSE OF THE STUDY

Environmental Authorisations are issued to project developments to ensure that environmental impacts as identified during the EIA process are avoided and/or minimized at both project construction and operational phases. The EA set out conditions which the development has to comply with to protect the environment for promoting sustainable development. The reason for this research is to determine the effectiveness of complying with the EA. If is just for the sake of complying with written conditions as per legislation or towards promoting sustainable development by minimizing the development impacts on the environment.

RESEARCH PROCESS

The study requires your participation in the following manner:

1. You will be required to complete a questionnaire.
2. The questionnaire may be discussed with you in an interview format for easy completion.
3. The questionnaire should be completed within 3 weeks.
4. There are no right or wrong answers and all opinions will be valued.
5. You do not need to prepare anything in advance to answer the questionnaire.
6. All participants will be given the opportunity to express an opinion, or agree or disagree with the opinion.

NOTIFICATION THAT PHOTOGRAPHIC MATERIAL, TAPE RECORDINGS, ETC WILL BE REQUIRED (Taking of photographs)

Your attention is drawn to the fact that the questionnaire interviews will be photographed to ensure that proof of those interviews are kept. You may request and/or scrutinise the photographs taken during interviews or site visits that you participated in.

CONFIDENTIALITY

The opinions of all the participants are viewed as strictly confidential, and only members of the research team will have access to the information. No data published in dissertations and journals will contain any information thorugh which participant members may be identified. Your anonymity is therefore ensured.

WITHDRAWAL CLAUSE

I understand that I may withdraw from the study participation at any time. I therefore participate voluntarily until such time as I request otherwise.

POTENTIAL BENEFITS OF THE STUDY

The study will determine whether the implementation of EA conditions is prioritised by projects/developments, complied with fully and ensure that sustainable development is at the forefront of developments that obtained EA's. The study will further illustrate the effectiveness or ineffectiveness of implementing the EA conditions for avoiding and/or minimizing further environmental damage as predicted or identified during the EIA phase of such projects.

INFORMATION

If I have any queries concerning the study, I may contact the supervisor, Prof Moja, at the Department of Environmental Sciences, Florida Campus, Unisa, Tel: 011 471 3878.

CONSENT

I, the undersigned, Calvin Langley (full name) have read the above information relating to the project and have also heard the verbal version, and declare that I understand it. I have been afforded the opportunity to discuss relevant aspects of the project with the project leader, and hereby declare that I agree voluntarily to participate in the project.

I indemnify the university and any employee or student of the university against any liability that I may incur during the course of the project.

I further undertake to make no claim against the university in respect of damages to my person or reputation that may be incurred as a result of the project/trial or through the fault of other participants, unless resulting from negligence on the part of the university, its employees or students.

I have received a signed copy of this consent form.

Signature of participant: .....

Signed at Kusile on 30/07/2015

WITNESSES

1 Robin Rogers

2 .....

QUESTIONNAIRE

PURPOSE: TO OBTAIN THE UNDERSTANDING OF COMPLYING WITH THE EA CONDITIONS BY THE PROJECT IMPLEMENTERS AT ESKOM'S KUSILE AND MEDUPI POWER STATIONS CONSTRUCTION PHASES

NATURE AND PURPOSE OF THE STUDY

The research study focuses on the effectiveness of implementing environmental authorisations by Medupi and Kusile Power Stations on their construction phases. The environmental authorisations (EA) are issued to project developments to ensure that environmental impacts as identified during the EIA process are avoided and/or minimized at both project construction and operational phases. The EA set out conditions which the development has to comply with to protect the environment for promoting sustainable development. The reason for this research is to determine the effectiveness of complying with the EA of these power stations.

Section A: PROFILE

1. Gender (Please indicate your choice with an "X").

Male	Female
X	

2. Number of years at Kusile Power Station, construction site.

0 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7
X						

What function do you currently perform?

- Environmentalist ☐
- Engineer ☒
- Project Manager/Coordinator ☐
- Senior Manager / Management ☐

- Ground worker ☐

SECTION B: QUESTIONS

The following set of questions describes your general perception towards the Environmental Authorisation conditions for Kusile Power Station. For each question, please indicate to which extent you agree or disagree. Please indicate your choice with an "X".

What is your perception towards the Environmental Authorisation conditions for Kusile power station? Please indicate your choice with an "X".	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. Are you aware of the Environmental Authorisation conditions for Kusile?	X				
2. Do you understand the purpose and importance of compliance to Environmental Authorisation conditions	X				
3. Have you implemented the Environmental Authorisation?	X				
4. Complying with Environmental Authorisation is waste of time					X
5. It is impossible to comply with all the conditions of the Environmental Authorisation					X
6. Most/some of the Environmental Authorisation conditions are - insignificant,					X
- irrelevant and					X
- impractical					X

7. All of the Environmental Authorisation conditions are - significant	X				
- relevant, and	X				
- practical	X				
8. Complying with all Environmental Authorisation conditions will promote/ensure sustainable development	X				
9. Environmental Authorisation is a good tool to ensure that project detrimental impacts are avoided and/or minimised	X				
Kindly provide a detailed suggestion or comment that you think may be useful towards compliance with Environmental Authorisation. Training; induction and awareness					

THANK YOU

UNISA

CONSENT FORM

TITLE OF RESEARCH PROJECT

A Review of the Environmental Authorization process followed during the construction of Eskom's Kusile and Medupi Power Stations, South Africa.

Dear Mr/Mrs/Miss/Ms _____ Date 30/07/2015

NATURE AND PURPOSE OF THE STUDY

Environmental Authorisations are issued to project developments to ensure that environmental impacts as identified during the EIA process are avoided and/or minimized at both project construction and operational phases. The EA set out conditions which the development has to comply with to protect the environment for promoting sustainable development. The reason for this research is to determine the effectiveness of complying with the EA. If is just for the sake of complying with written conditions as per legislation or towards promoting sustainable development by minimizing the development impacts on the environment.

RESEARCH PROCESS

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1. You will be required to complete a questionnaire.
2. The questionnaire may be discussed with you in an interview format for easy completion.
3. The questionnaire should be completed within 3 weeks.
4. There are no right or wrong answers and all opinions will be valued.
5. You do not need to prepare anything in advance to answer the questionnaire.
6. All participants will be given the opportunity to express an opinion, or agree or disagree with the opinion.

NOTIFICATION THAT PHOTOGRAPHIC MATERIAL, TAPE RECORDINGS, ETC WILL BE REQUIRED (Taking of photographs)

Your attention is drawn to the fact that the questionnaire interviews will be photographed to ensure that proof of those interviews are kept. You may request and/or scrutinise the photographs taken during interviews or site visits that you participated in.

CONFIDENTIALITY

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WITHDRAWAL CLAUSE

I understand that I may withdraw from the study participation at any time. I therefore participate voluntarily until such time as I request otherwise.

POTENTIAL BENEFITS OF THE STUDY

The study will determine whether the implementation of EA conditions is prioritised by projects/developments, complied with fully and ensure that sustainable development is at the forefront of developments that obtained EA's. The study will further illustrate the effectiveness or ineffectiveness of implementing the EA conditions for avoiding and/or minimizing further environmental damage as predicted or identified during the EIA phase of such projects.

INFORMATION

If I have any queries concerning the study, I may contact the supervisor, Prof Moja, at the Department of Environmental Sciences, Florida Campus, Unisa, Tel: 011 471 3878.

CONSENT

I, the undersigned, Hulisani Khorommbi ..... (full name) have read the above information relating to the project and have also heard the verbal version, and declare that I understand it. I have been afforded the opportunity to discuss relevant aspects of the project with the project leader, and hereby declare that I agree voluntarily to participate in the project.

I indemnify the university and any employee or student of the university against any liability that I may incur during the course of the project.

I further undertake to make no claim against the university in respect of damages to my person or reputation that may be incurred as a result of the project/trial or through the fault of other participants, unless resulting from negligence on the part of the university, its employees or students.

I have received a signed copy of this consent form.

Signature of participant: .....

Signed at Kusile ..... on 30/07/2015

WITNESSES

1 .....

2 .....

QUESTIONNAIRE

PURPOSE: TO OBTAIN THE UNDERSTANDING OF COMPLYING WITH THE EA CONDITIONS BY THE PROJECT IMPLEMENTERS AT ESKOM'S KUSILE AND MEDUPI POWER STATIONS CONSTRUCTION PHASES

NATURE AND PURPOSE OF THE STUDY

The research study focuses on the effectiveness of implementing environmental authorisations by Medupi and Kusile Power Stations on their construction phases. The environmental authorisations (EA) are issued to project developments to ensure that environmental impacts as identified during the EIA process are avoided and/or minimized at both project construction and operational phases. The EA set out conditions which the development has to comply with to protect the environment for promoting sustainable development. The reason for this research is to determine the effectiveness of complying with the EA of these power stations.

Section A: PROFILE

1. Gender (Please indicate your choice with an "X").

Male	Female
X	

2. Number of years at Kusile Power Station, construction site.

0 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7
	X					

What function do you currently perform?

- Environmentalist ☐
- Engineer ☒
- Project Manager/Coordinator ☐
- Senior Manager / Management ☐

- Ground worker

SECTION B: QUESTIONS

The following set of questions describes your general perception towards the Environmental Authorisation conditions for Kusile Power Station. For each question, please indicate to which extent you agree or disagree. Please indicate your choice with an "X".

What is your perception towards the Environmental Authorisation conditions for Kusile power station? Please indicate your choice with an "X".	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. Are you aware of the Environmental Authorisation conditions for Kusile?				X	
2. Do you understand the purpose and importance of compliance to Environmental Authorisation conditions	X				
3. Have you implemented the Environmental Authorisation?				X	
4. Complying with Environmental Authorisation is waste of time				X	
5. It is impossible to comply with all the conditions of the Environmental Authorisation			X		
6. Most/some of the Environmental Authorisation conditions are - insignificant,			X		
- irrelevant and					X
- impractical		X			

7. All of the Environmental Authorisation conditions are - significant			X		
- relevant, and			X		
- practical				X	
8. Complying with all Environmental Authorisation conditions will promote/ensure sustainable development			X.		
9. Environmental Authorisation is a good tool to ensure that project detrimental impacts are avoided and/or minimised			X		

Kindly provide a detailed suggestion or comment that you think may be useful towards compliance with Environmental Authorisation.

The way in which environmental issues are communicated. create a gap. for example. During induction of toolbox talks issues are highlighted and ~~not~~ so secondly. the procedures are not well communicated. where to find them. and. to whom shall one contact is not well outlined. I have been on site for a year, but never seen SHEQ policy / Environmental policy.

Resource utilisation. like fuel. should be measured on Eskom properties. not on contractors. Environmental system should influence the contractors. Do we know how much our contractors utilizes on sites I think. other than.

physical impacts on Environment, we impact more by resource utilization.

THANK YOU

UNISA

CONSENT FORM

TITLE OF RESEARCH PROJECT

A Review of the Environmental Authorization process followed during the construction of Eskom's Kusile and Medupi Power Stations, South Africa.

Dear Mr/~~Mrs/Miss/Ms~~ Tshithiwa Netshanda. Date 30/07/2015

NATURE AND PURPOSE OF THE STUDY

Environmental Authorisations are issued to project developments to ensure that environmental impacts as identified during the EIA process are avoided and/or minimized at both project construction and operational phases. The EA set out conditions which the development has to comply with to protect the environment for promoting sustainable development. The reason for this research is to determine the effectiveness of complying with the EA. If is just for the sake of complying with written conditions as per legislation or towards promoting sustainable development by minimizing the development impacts on the environment.

RESEARCH PROCESS

The study requires your participation in the following manner:

1. You will be required to complete a questionnaire.
2. The questionnaire may be discussed with you in an interview format for easy completion.
3. The questionnaire should be completed within 3 weeks.
4. There are no right or wrong answers and all opinions will be valued.
5. You do not need to prepare anything in advance to answer the questionnaire.
6. All participants will be given the opportunity to express an opinion, or agree or disagree with the opinion.

NOTIFICATION THAT PHOTOGRAPHIC MATERIAL, TAPE RECORDINGS, ETC WILL BE REQUIRED (Taking of photographs)

Your attention is drawn to the fact that the questionnaire interviews will be photographed to ensure that proof of those interviews are kept. You may request and/or scrutinise the photographs taken during interviews or site visits that you participated in.

CONFIDENTIALITY

The opinions of all the participants are viewed as strictly confidential, and only members of the research team will have access to the information. No data published in dissertations and journals will contain any information thorugh which participant members may be identified. Your anonymity is therefore ensured.

WITHDRAWAL CLAUSE

I understand that I may withdraw from the study participation at any time. I therefore participate voluntarily until such time as I request otherwise.

POTENTIAL BENEFITS OF THE STUDY

The study will determine whether the implementation of EA conditions is prioritised by projects/developments, complied with fully and ensure that sustainable development is at the forefront of developments that obtained EA's. The study will further illustrate the effectiveness or ineffectiveness of implementing the EA conditions for avoiding and/or minimizing further environmental damage as predicted or identified during the EIA phase of such projects.

INFORMATION

If I have any queries concerning the study, I may contact the supervisor, Prof Moja, at the Department of Environmental Sciences, Florida Campus, Unisa, Tel: 011 471 3878.

CONSENT

I, the undersigned, Ishfeluwa Netshandu ..... (full name) have read the above information relating to the project and have also heard the verbal version, and declare that I understand it. I have been afforded the opportunity to discuss relevant aspects of the project with the project leader, and hereby declare that I agree voluntarily to participate in the project.

I indemnify the university and any employee or student of the university against any liability that I may incur during the course of the project.

I further undertake to make no claim against the university in respect of damages to my person or reputation that may be incurred as a result of the project/trial or through the fault of other participants, unless resulting from negligence on the part of the university, its employees or students.

I have received a signed copy of this consent form.

Signature of participant: .....

Signed at Kusile on 30/07/2015

WITNESSES

1 .....

2 .....

QUESTIONNAIRE

PURPOSE: TO OBTAIN THE UNDERSTANDING OF COMPLYING WITH THE EA CONDITIONS BY THE PROJECT IMPLEMENTERS AT ESKOM'S KUSILE AND MEDUPI POWER STATIONS CONSTRUCTION PHASES

NATURE AND PURPOSE OF THE STUDY

The research study focuses on the effectiveness of implementing environmental authorisations by Medupi and Kusile Power Stations on their construction phases. The environmental authorisations (EA) are issued to project developments to ensure that environmental impacts as identified during the EIA process are avoided and/or minimized at both project construction and operational phases. The EA set out conditions which the development has to comply with to protect the environment for promoting sustainable development. The reason for this research is to determine the effectiveness of complying with the EA of these power stations.

Section A: PROFILE

1. Gender (Please indicate your choice with an "X").

Male	Female
✓	

2. Number of years at Medupi Power Station, construction site.

0 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	7 - more
			✓			

What function do you currently perform?

- Environmentalist ☐
- Engineer ☐

- Project Manager/Coordinator ☐
- Senior Manager / Management ☐
- Ground worker ☑

SECTION B: QUESTIONS

The following set of questions describes your general perception towards the Environmental Authorisation conditions for Medupi Power Station. For each question, please indicate to which extent you agree or disagree. Please indicate your choice with an "X".

What is your perception towards the Environmental Authorisation conditions for ~~Kusile~~ Medupi power station? Please indicate your choice with an "X".	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. Are you aware of the Environmental Authorisation conditions for ~~Kusile~~ Medupi?	✓				
2. Do you understand the purpose and importance of compliance to Environmental Authorisation conditions	✓				
3. Have you implemented the Environmental Authorisation?		✓			
4. Complying with Environmental Authorisation is waste of time					✓
5. It is impossible to comply with all the conditions of the Environmental Authorisation				✓	
6. Most/some of the Environmental Authorisation conditions are - insignificant,				✓	

- irrelevant and				✓	
- impractical				✓	
7. All of the Environmental Authorisation conditions are - significant	✓				
- relevant, and	✓				
- practical	✓				
8. Complying with all Environmental Authorisation conditions will promote/ensure sustainable development	✓				
9. Environmental Authorisation is a good tool to ensure that project detrimental impacts are avoided and/or minimised	✓				

Kindly provide a detailed suggestion or comment that you think may be useful towards compliance with Environmental Authorisation.

* Training should be given to people on the ground for them to have a better Understand of the long term Impacts that can occure
* Provide us- with the latest reviewed enviromental plans that will help us not to meitain the Impacts but to elimined them before they can even occure

THANK YOU

UNISA university of south africa

CONSENT FORM

TITLE OF RESEARCH PROJECT

A Review of the Environmental Authorization process followed during the construction of Eskom's Kusile and Medupi Power Stations, South Africa.

Dear Mr/Mrs/Miss/Ms _____ Date 09/07/2015

NATURE AND PURPOSE OF THE STUDY

Environmental Authorisations are issued to project developments to ensure that environmental impacts as identified during the EIA process are avoided and/or minimized at both project construction and operational phases. The EA set out conditions which the development has to comply with to protect the environment for promoting sustainable development. The reason for this research is to determine the effectiveness of complying with the EA. If is just for the sake of complying with written conditions as per legislation or towards promoting sustainable development by minimizing the development impacts on the environment.

RESEARCH PROCESS

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1. You will be required to complete a questionnaire.
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5. You do not need to prepare anything in advance to answer the questionnaire.
6. All participants will be given the opportunity to express an opinion, or agree or disagree with the opinion.

NOTIFICATION THAT PHOTOGRAPHIC MATERIAL, TAPE RECORDINGS, ETC WILL BE REQUIRED (Taking of photographs)

Your attention is drawn to the fact that the questionnaire interviews will be photographed to ensure that proof of those interviews are kept. You may request and/or scrutinise the photographs taken during interviews or site visits that you participated in.

CONFIDENTIALITY

The opinions of all the participants are viewed as strictly confidential, and only members of the research team will have access to the information. No data published in dissertations and journals will contain any information thorugh which participant members may be identified. Your anonymity is therefore ensured.

WITHDRAWAL CLAUSE

I understand that I may withdraw from the study participation at any time. I therefore participate voluntarily until such time as I request otherwise.

POTENTIAL BENEFITS OF THE STUDY

The study will determine whether the implementation of EA conditions is prioritised by projects/developments, complied with fully and ensure that sustainable development is at the forefront of developments that obtained EA's. The study will further illustrate the effectiveness or ineffectiveness of implementing the EA conditions for avoiding and/or minimizing further environmental damage as predicted or identified during the EIA phase of such projects.

INFORMATION

If I have any queries concerning the study, I may contact the supervisor, Prof Moja, at the Department of Environmental Sciences, Florida Campus, Unisa, Tel: 011 471 3878.

CONSENT

I, the undersigned, ...Lebogang Monaisa..... (full name) have read the above information relating to the project and have also heard the verbal version, and declare that I understand it. I have been afforded the opportunity to discuss relevant aspects of the project with the project leader, and hereby declare that I agree voluntarily to participate in the project.

I indemnify the university and any employee or student of the university against any liability that I may incur during the course of the project.

I further undertake to make no claim against the university in respect of damages to my person or reputation that may be incurred as a result of the project/trial or through the fault of other participants, unless resulting from negligence on the part of the university, its employees or students.

I have received a signed copy of this consent form.

Signature of participant: .....

Signed at ..... on .....

WITNESSES

1 .....

2 .....

QUESTIONNAIRE

PURPOSE: TO OBTAIN THE UNDERSTANDING OF COMPLYING WITH THE EA CONDITIONS BY THE PROJECT IMPLEMENTERS AT ESKOM'S KUSILE AND MEDUPI POWER STATIONS CONSTRUCTION PHASES

NATURE AND PURPOSE OF THE STUDY

The research study focuses on the effectiveness of implementing environmental authorisations by Medupi and Kusile Power Stations on their construction phases. The environmental authorisations (EA) are issued to project developments to ensure that environmental impacts as identified during the EIA process are avoided and/or minimized at both project construction and operational phases. The EA set out conditions which the development has to comply with to protect the environment for promoting sustainable development. The reason for this research is to determine the effectiveness of complying with the EA of these power stations.

Section A: PROFILE

1. Gender (Please indicate your choice with an "X").

Male	Female
X	

2. Number of years at Medupi Power Station, construction site.

0 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	7 - more
				X		

What function do you currently perform?

- Environmentalist ☐
- Engineer ☐

- Project Manager/Coordinator ☐
- Senior Manager / Management ☐
- Ground worker ☒

SECTION B: QUESTIONS

The following set of questions describes your general perception towards the Environmental Authorisation conditions for Medupi Power Station. For each question, please indicate to which extent you agree or disagree. Please indicate your choice with an "X".

What is your perception towards the Environmental Authorisation conditions for Kusile power station? Please indicate your choice with an "X".	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. Are you aware of the Environmental Authorisation conditions for Kusile?	X				
2. Do you understand the purpose and importance of compliance to Environmental Authorisation conditions	X				
3. Have you implemented the Environmental Authorisation?	X				
4. Complying with Environmental Authorisation is waste of time					X
5. It is impossible to comply with all the conditions of the Environmental Authorisation	X				
6. Most/some of the Environmental Authorisation conditions are - insignificant,					X

- irrelevant and					X
- impractical					X
7. All of the Environmental Authorisation conditions are - significant	X				
- relevant, and	X				
- practical	X				
8. Complying with all Environmental Authorisation conditions will promote/ensure sustainable development	X				
9. Environmental Authorisation is a good tool to ensure that project detrimental impacts are avoided and/or minimised	X				

Kindly provide a detailed suggestion or comment that you think may be useful towards compliance with Environmental Authorisation.

* The Environmental Authorisation helps us to keep our Environment safe and clean.
* By following the Environmental Plan
* Helping us when we do Audit.
*

THANK YOU

UNISA university of south africa

CONSENT FORM

TITLE OF RESEARCH PROJECT

A Review of the Environmental Authorization process followed during the construction of Eskom's Kusile and Medupi Power Stations, South Africa.

Dear Mr/Mrs/Miss/Ms _____ Date 09/07/2015

NATURE AND PURPOSE OF THE STUDY

Environmental Authorisations are issued to project developments to ensure that environmental impacts as identified during the EIA process are avoided and/or minimized at both project construction and operational phases. The EA set out conditions which the development has to comply with to protect the environment for promoting sustainable development. The reason for this research is to determine the effectiveness of complying with the EA. If is just for the sake of complying with written conditions as per legislation or towards promoting sustainable development by minimizing the development impacts on the environment.

RESEARCH PROCESS

The study requires your participation in the following manner:

1. You will be required to complete a questionnaire.
2. The questionnaire may be discussed with you in an interview format for easy completion.
3. The questionnaire should be completed within 3 weeks.
4. There are no right or wrong answers and all opinions will be valued.
5. You do not need to prepare anything in advance to answer the questionnaire.
6. All participants will be given the opportunity to express an opinion, or agree or disagree with the opinion.

NOTIFICATION THAT PHOTOGRAPHIC MATERIAL, TAPE RECORDINGS, ETC WILL BE REQUIRED (Taking of photographs)

Your attention is drawn to the fact that the questionnaire interviews will be photographed to ensure that proof of those interviews are kept. You may request and/or scrutinise the photographs taken during interviews or site visits that you participated in.

CONFIDENTIALITY

The opinions of all the participants are viewed as strictly confidential, and only members of the research team will have access to the information. No data published in dissertations and journals will contain any information thorugh which participant members may be identified. Your anonymity is therefore ensured.

WITHDRAWAL CLAUSE

I understand that I may withdraw from the study participation at any time. I therefore participate voluntarily until such time as I request otherwise.

POTENTIAL BENEFITS OF THE STUDY

The study will determine whether the implementation of EA conditions is prioritised by projects/developments, complied with fully and ensure that sustainable development is at the forefront of developments that obtained EA's. The study will further illustrate the effectiveness or ineffectiveness of implementing the EA conditions for avoiding and/or minimizing further environmental damage as predicted or identified during the EIA phase of such projects.

INFORMATION

If I have any queries concerning the study, I may contact the supervisor, Prof Moja, at the Department of Environmental Sciences, Florida Campus, Unisa, Tel: 011 471 3878.

CONSENT

I, the undersigned, ...JACKSON KEKANA..... (full name) have read the above information relating to the project and have also heard the verbal version, and declare that I understand it. I have been afforded the opportunity to discuss relevant aspects of the project with the project leader, and hereby declare that I agree voluntarily to participate in the project.

I indemnify the university and any employee or student of the university against any liability that I may incur during the course of the project.

I further undertake to make no claim against the university in respect of damages to my person or reputation that may be incurred as a result of the project/trial or through the fault of other participants, unless resulting from negligence on the part of the university, its employees or students.

I have received a signed copy of this consent form.

Signature of participant: .....

Signed at ...ECSY (MEDUPI)... on 09/07/2015

WITNESSES

1 .....

2 .....

QUESTIONNAIRE

PURPOSE: TO OBTAIN THE UNDERSTANDING OF COMPLYING WITH THE EA CONDITIONS BY THE PROJECT IMPLEMENTERS AT ESKOM'S KUSILE AND MEDUPI POWER STATIONS CONSTRUCTION PHASES

NATURE AND PURPOSE OF THE STUDY

The research study focuses on the effectiveness of implementing environmental authorisations by Medupi and Kusile Power Stations on their construction phases. The environmental authorisations (EA) are issued to project developments to ensure that environmental impacts as identified during the EIA process are avoided and/or minimized at both project construction and operational phases. The EA set out conditions which the development has to comply with to protect the environment for promoting sustainable development. The reason for this research is to determine the effectiveness of complying with the EA of these power stations.

Section A: PROFILE

1. Gender (Please indicate your choice with an "X").

Male	Female
X	

2. Number of years at Medupi Power Station, construction site.

0 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	7 - more
				X		

What function do you currently perform?

- Environmentalist ☐
- Engineer ☐

- Project Manager/Coordinator
- Senior Manager / Management
- Ground worker X

SECTION B: QUESTIONS

The following set of questions describes your general perception towards the Environmental Authorisation conditions for Medupi Power Station. For each question, please indicate to which extent you agree or disagree. Please indicate your choice with an "X".

What is your perception towards the Environmental Authorisation conditions for Kusile power station? Please indicate your choice with an "X".	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. Are you aware of the Environmental Authorisation conditions for Kusile?	X				
2. Do you understand the purpose and importance of compliance to Environmental Authorisation conditions	X				
3. Have you implemented the Environmental Authorisation?		X			
4. Complying with Environmental Authorisation is waste of time				X	
5. It is impossible to comply with all the conditions of the Environmental Authorisation				X	
6. Most/some of the Environmental Authorisation conditions are - insignificant,				X	

- irrelevant and				X	
- impractical					
7. All of the Environmental Authorisation conditions are - significant	X				
- relevant, and	X				
- practical	X				
8. Complying with all Environmental Authorisation conditions will promote/ensure sustainable development	X				
9. Environmental Authorisation is a good tool to ensure that project detrimental impacts are avoided and/or minimised	X				

Kindly provide a detailed suggestion or comment that you think may be useful towards compliance with Environmental Authorisation.

THANK YOU

UNISA university of south africa

CONSENT FORM

TITLE OF RESEARCH PROJECT

A Review of the Environmental Authorization process followed during the construction of Eskom's Kusile and Medupi Power Stations, South Africa.

Dear Mr/Mrs/Miss/Ms Sydney Date 09/07/2015

NATURE AND PURPOSE OF THE STUDY

Environmental Authorisations are issued to project developments to ensure that environmental impacts as identified during the EIA process are avoided and/or minimized at both project construction and operational phases. The EA set out conditions which the development has to comply with to protect the environment for promoting sustainable development. The reason for this research is to determine the effectiveness of complying with the EA. If is just for the sake of complying with written conditions as per legislation or towards promoting sustainable development by minimizing the development impacts on the environment.

RESEARCH PROCESS

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WITHDRAWAL CLAUSE

I understand that I may withdraw from the study participation at any time. I therefore participate voluntarily until such time as I request otherwise.

POTENTIAL BENEFITS OF THE STUDY

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INFORMATION

If I have any queries concerning the study, I may contact the supervisor, Prof Moja, at the Department of Environmental Sciences, Florida Campus, Unisa, Tel: 011 471 3878.

CONSENT

I, the undersigned, ...SYDNEY MATHABA..... (full name) have read the above information relating to the project and have also heard the verbal version, and declare that I understand it. I have been afforded the opportunity to discuss relevant aspects of the project with the project leader, and hereby declare that I agree voluntarily to participate in the project.

I indemnify the university and any employee or student of the university against any liability that I may incur during the course of the project.

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I have received a signed copy of this consent form.

Signature of participant: .....

Signed at ..MEDUPI..... on ..09.07.2015.....

WITNESSES

1 .....

2 .....

QUESTIONNAIRE

PURPOSE: TO OBTAIN THE UNDERSTANDING OF COMPLYING WITH THE EA CONDITIONS BY THE PROJECT IMPLEMENTERS AT ESKOM'S KUSILE AND MEDUPI POWER STATIONS CONSTRUCTION PHASES

NATURE AND PURPOSE OF THE STUDY

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Section A: PROFILE

1. Gender (Please indicate your choice with an "X").

Male	Female
X	

2. Number of years at Medupi Power Station, construction site.

0 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	7 - more
		X				

What function do you currently perform?

- Environmentalist ☐
- Engineer ☐

- Project Manager/Coordinator ☐
- Senior Manager / Management ☐
- Ground worker ☒

SECTION B: QUESTIONS

The following set of questions describes your general perception towards the Environmental Authorisation conditions for Medupi Power Station. For each question, please indicate to which extent you agree or disagree. Please indicate your choice with an "X".

What is your perception towards the Environmental Authorisation conditions for ~~Kusile~~ Medupi power station? Please indicate your choice with an "X".	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. Are you aware of the Environmental Authorisation conditions for ~~Kusile~~ Medupi?		X			
2. Do you understand the purpose and importance of compliance to Environmental Authorisation conditions	X				
3. Have you implemented the Environmental Authorisation?					X
4. Complying with Environmental Authorisation is waste of time					X
5. It is impossible to comply with all the conditions of the Environmental Authorisation			X		
6. Most/some of the Environmental Authorisation conditions are - insignificant,					
			X		

- irrelevant and			X		
- impractical			X		
7. All of the Environmental Authorisation conditions are - significant		X			
- relevant, and		X			
- practical			X		
8. Complying with all Environmental Authorisation conditions will promote/ensure sustainable development		X			
9. Environmental Authorisation is a good tool to ensure that project detrimental impacts are avoided and/or minimised	X				

Kindly provide a detailed suggestion or comment that you think may be useful towards compliance with Environmental Authorisation.

No Comment

THANK YOU

CONSENT FORM

TITLE OF RESEARCH PROJECT

A Review of the Environmental Authorization process followed during the construction of Eskom's Kusile and Medupi Power Stations, South Africa.

Dear Mr/Mrs/Miss/Ms _____ Date 09/07/2015

NATURE AND PURPOSE OF THE STUDY

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WITHDRAWAL CLAUSE

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POTENTIAL BENEFITS OF THE STUDY

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INFORMATION

If I have any queries concerning the study, I may contact the supervisor, Prof Moja, at the Department of Environmental Sciences, Florida Campus, Unisa, Tel: 011 471 3878.

CONSENT STEVE MAPHOPHA

I, the undersigned, ... (full name) have read the above information relating to the project and have also heard the verbal version, and declare that I understand it. I have been afforded the opportunity to discuss relevant aspects of the project with the project leader, and hereby declare that I agree voluntarily to participate in the project.

I indemnify the university and any employee or student of the university against any liability that I may incur during the course of the project.

I further undertake to make no claim against the university in respect of damages to my person or reputation that may be incurred as a result of the project/trial or through the fault of other participants, unless resulting from negligence on the part of the university, its employees or students.

I have received a signed copy of this consent form.

Signature of participant: .....

Signed at Medupi ..... on 09/07/2015

WITNESSES

1 .....

2 .....

QUESTIONNAIRE

PURPOSE: TO OBTAIN THE UNDERSTANDING OF COMPLYING WITH THE EA CONDITIONS BY THE PROJECT IMPLEMENTERS AT ESKOM'S KUSILE AND MEDUPI POWER STATIONS CONSTRUCTION PHASES

NATURE AND PURPOSE OF THE STUDY

The research study focuses on the effectiveness of implementing environmental authorisations by Medupi and Kusile Power Stations on their construction phases. The environmental authorisations (EA) are issued to project developments to ensure that environmental impacts as identified during the EIA process are avoided and/or minimized at both project construction and operational phases. The EA set out conditions which the development has to comply with to protect the environment for promoting sustainable development. The reason for this research is to determine the effectiveness of complying with the EA of these power stations.

Section A: PROFILE

1. Gender (Please indicate your choice with an "X").

Male	Female
X	

2. Number of years at Medupi Power Station, construction site.

0 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	7 - more
					X	

What function do you currently perform?

- Environmentalist ☐
- Engineer ☐

- Project Manager/Coordinator ☐
- Senior Manager / Management ☐
- Ground worker ☒

SECTION B: QUESTIONS

The following set of questions describes your general perception towards the Environmental Authorisation conditions for Medupi Power Station. For each question, please indicate to which extent you agree or disagree. Please indicate your choice with an "X".

What is your perception towards the Environmental Authorisation conditions for Kusile power station? Please indicate your choice with an "X".	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. Are you aware of the Environmental Authorisation conditions for Kusile?		X			
2. Do you understand the purpose and importance of compliance to Environmental Authorisation conditions	X				
3. Have you implemented the Environmental Authorisation?	X				
4. Complying with Environmental Authorisation is waste of time					X
5. It is impossible to comply with all the conditions of the Environmental Authorisation		X			
6. Most/some of the Environmental Authorisation conditions are - insignificant,				X	

- irrelevant and				X	
- impractical				X	
7. All of the Environmental Authorisation conditions are - significant	X				
- relevant, and	X				
- practical	X				
8. Complying with all Environmental Authorisation conditions will promote/ensure sustainable development		X			
9. Environmental Authorisation is a good tool to ensure that project detrimental impacts are avoided and/or minimised	X				

Kindly provide a detailed suggestion or comment that you think may be useful towards compliance with Environmental Authorisation.

No Comment

THANK YOU

UNISA university of south africa

CONSENT FORM

TITLE OF RESEARCH PROJECT

A Review of the Environmental Authorization process followed during the construction of Eskom's Kusile and Medupi Power Stations, South Africa.

Dear Mr/Mrs/Miss/Ms _____ Date 09/07/2015

NATURE AND PURPOSE OF THE STUDY

Environmental Authorisations are issued to project developments to ensure that environmental impacts as identified during the EIA process are avoided and/or minimized at both project construction and operational phases. The EA set out conditions which the development has to comply with to protect the environment for promoting sustainable development. The reason for this research is to determine the effectiveness of complying with the EA. If is just for the sake of complying with written conditions as per legislation or towards promoting sustainable development by minimizing the development impacts on the environment.

RESEARCH PROCESS

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CONFIDENTIALITY

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WITHDRAWAL CLAUSE

I understand that I may withdraw from the study participation at any time. I therefore participate voluntarily until such time as I request otherwise.

POTENTIAL BENEFITS OF THE STUDY

The study will determine whether the implementation of EA conditions is prioritised by projects/developments, complied with fully and ensure that sustainable development is at the forefront of developments that obtained EA's. The study will further illustrate the effectiveness or ineffectiveness of implementing the EA conditions for avoiding and/or minimizing further environmental damage as predicted or identified during the EIA phase of such projects.

INFORMATION

If I have any queries concerning the study, I may contact the supervisor, Prof Moja, at the Department of Environmental Sciences, Florida Campus, Unisa, Tel: 011 471 3878.

CONSENT

I, the undersigned, ...NDIVHUHO MOLIBALI..... (full name) have read the above information relating to the project and have also heard the verbal version, and declare that I understand it. I have been afforded the opportunity to discuss relevant aspects of the project with the project leader, and hereby declare that I agree voluntarily to participate in the project.

I indemnify the university and any employee or student of the university against any liability that I may incur during the course of the project.

I further undertake to make no claim against the university in respect of damages to my person or reputation that may be incurred as a result of the project/trial or through the fault of other participants, unless resulting from negligence on the part of the university, its employees or students.

I have received a signed copy of this consent form.

Signature of participant: .....

Signed at ...Medupi..... on ...09/07/2015...

WITNESSES

1 .....

2 .....

QUESTIONNAIRE

PURPOSE: TO OBTAIN THE UNDERSTANDING OF COMPLYING WITH THE EA CONDITIONS BY THE PROJECT IMPLEMENTERS AT ESKOM'S KUSILE AND MEDUPI POWER STATIONS CONSTRUCTION PHASES

NATURE AND PURPOSE OF THE STUDY

The research study focuses on the effectiveness of implementing environmental authorisations by Medupi and Kusile Power Stations on their construction phases. The environmental authorisations (EA) are issued to project developments to ensure that environmental impacts as identified during the EIA process are avoided and/or minimized at both project construction and operational phases. The EA set out conditions which the development has to comply with to protect the environment for promoting sustainable development. The reason for this research is to determine the effectiveness of complying with the EA of these power stations.

Section A: PROFILE

1. Gender (Please indicate your choice with an "X").

Male	Female
	X

2. Number of years at Medupi Power Station, construction site.

0 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	7 - more
				X		

What function do you currently perform?

- Environmentalist ☐
- Engineer ☐

- Project Manager/Coordinator ☐
- Senior Manager / Management ☐
- Ground worker ☒

SECTION B: QUESTIONS

The following set of questions describes your general perception towards the Environmental Authorisation conditions for Medupi Power Station. For each question, please indicate to which extent you agree or disagree. Please indicate your choice with an "X".

What is your perception towards the Environmental Authorisation conditions for Kusile power station? Please indicate your choice with an "X".	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. Are you aware of the Environmental Authorisation conditions for Kusile?	X				
2. Do you understand the purpose and importance of compliance to Environmental Authorisation conditions	X				
3. Have you implemented the Environmental Authorisation?					X
4. Complying with Environmental Authorisation is waste of time		X			
5. It is impossible to comply with all the conditions of the Environmental Authorisation	X				
6. Most/some of the Environmental Authorisation conditions are - insignificant,					
				X	

- irrelevant and					X
- impractical					X
7. All of the Environmental Authorisation conditions are - significant		X			
- relevant, and		X			
- practical		X			
8. Complying with all Environmental Authorisation conditions will promote/ensure sustainable development	X				
9. Environmental Authorisation is a good tool to ensure that project detrimental impacts are avoided and/or minimised	X				

Kindly provide a detailed suggestion or comment that you think may be useful towards compliance with Environmental Authorisation.

No further comments

THANK YOU

UNISA university of south africa

CONSENT FORM

TITLE OF RESEARCH PROJECT

A Review of the Environmental Authorization process followed during the construction of Eskom's Kusile and Medupi Power Stations, South Africa.

Dear Mr/Mrs/Miss/Ms _____ Date 09/07/2015

NATURE AND PURPOSE OF THE STUDY

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WITHDRAWAL CLAUSE

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INFORMATION

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CONSENT

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I have received a signed copy of this consent form.

Signature of participant: .....

Signed at ...Medupi..... on ...09/07/2015

WITNESSES

1 .....

2 .....

QUESTIONNAIRE

PURPOSE: TO OBTAIN THE UNDERSTANDING OF COMPLYING WITH THE EA CONDITIONS BY THE PROJECT IMPLEMENTERS AT ESKOM'S KUSILE AND MEDUPI POWER STATIONS CONSTRUCTION PHASES

NATURE AND PURPOSE OF THE STUDY

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Section A: PROFILE

1. Gender (Please indicate your choice with an "X").

Male	Female
X	

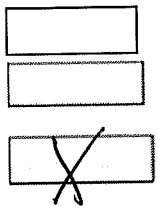
2. Number of years at Medupi Power Station, construction site.

0 - 1	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	7 - more
		X				

What function do you currently perform?

- Environmentalist ☐
- Engineer ☐

- Project Manager/Coordinator
- Senior Manager / Management
- Ground worker



SECTION B: QUESTIONS

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What is your perception towards the Environmental Authorisation conditions for Kusile power station? Please indicate your choice with an "X".	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. Are you aware of the Environmental Authorisation conditions for ~~Kusile?~~ Medupi		X			
2. Do you understand the purpose and importance of compliance to Environmental Authorisation conditions	X				
3. Have you implemented the Environmental Authorisation?		X			
4. Complying with Environmental Authorisation is waste of time	X				
5. It is impossible to comply with all the conditions of the Environmental Authorisation	X				
6. Most/some of the Environmental Authorisation conditions are - insignificant,					X

- irrelevant and					X
- impractical					X
7. All of the Environmental Authorisation conditions are - significant	X				
- relevant, and	X				
- practical	X				
8. Complying with all Environmental Authorisation conditions will promote/ensure sustainable development	X				
9. Environmental Authorisation is a good tool to ensure that project detrimental impacts are avoided and/or minimised	X				

Kindly provide a detailed suggestion or comment that you think may be useful towards compliance with Environmental Authorisation.

People don't know the importance of waste separation. & bi waste bin labelling because others are mixing it.

THANK YOU

UNISA university of south africa

CONSENT FORM

TITLE OF RESEARCH PROJECT

A Review of the Environmental Authorization process followed during the construction of Eskom's Kusile and Medupi Power Stations, South Africa.

Dear Mr/Mrs/Miss/Ms _____ Date. 09/07/2015

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I understand that I may withdraw from the study participation at any time. I therefore participate voluntarily until such time as I request otherwise.

POTENTIAL BENEFITS OF THE STUDY

The study will determine whether the implementation of EA conditions is prioritised by projects/developments, complied with fully and ensure that sustainable development is at the forefront of developments that obtained EA's. The study will further illustrate the effectiveness or ineffectiveness of implementing the EA conditions for avoiding and/or minimizing further environmental damage as predicted or identified during the EIA phase of such projects.

INFORMATION

If I have any queries concerning the study, I may contact the supervisor, Prof Moja, at the Department of Environmental Sciences, Florida Campus, Unisa, Tel: 011 471 3878.

CONSENT

I, the undersigned, ... (full name) have read the above information relating to the project and have also heard the verbal version, and declare that I understand it. I have been afforded the opportunity to discuss relevant aspects of the project with the project leader, and hereby declare that I agree voluntarily to participate in the project.

I indemnify the university and any employee or student of the university against any liability that I may incur during the course of the project.

I further undertake to make no claim against the university in respect of damages to my person or reputation that may be incurred as a result of the project/trial or through the fault of other participants, unless resulting from negligence on the part of the university, its employees or students.

I have received a signed copy of this consent form.

Signature of participant: ....

Signed at Medupi on 09/07/2015

WITNESSES

1 ....

2 ....